Applicant Name Bainville, Town of
Project Name Bainville Wastewater System Improvements

Project Abstract

The Town of Bainville's collection system was constructed in the 1950s consisting predominantly of eight-inch clay tile. About 15% to 20% of the pipe was replaced in 1999, along with the lift station. The lagoons were constructed circa 1975, but no lining was placed.

The state visited the Bainville lagoons in 2004. The first visit noted concerns about leakage, while the second noted that the lagoon dikes were so severely eroded as to be vertical and in some cases concave. Failure of the dikes and outflow of 30 years of sludge appears imminent. The clay tile collection system pipe leaks excessively and the current wastewater contribution per capita is 162 gallons per day. Inspections demonstrated a high groundwater table and high infiltration. Standing water level in a disconnected manhole was three feet from the surface in northeastern parts of town.

The Preliminary Engineering Report (PER) proposed the following actions and funding is being sought to:

- Clear and videotape all sewer lines;
- Replace the sewer lines shown to have the worst potential for leakage, estimated at 2,400 feet;
- Construct a three-cell facultative system and provide a liner for all cells;
- Dispose sludge; and
- Provide for final wastewater disposal through irrigation.

The most significant benefit of the proposed project is preservation of the groundwater, surface water, public health, and public safety. With dike failure imminent, the proposed project is absolutely essential to preservation of Shotgun Creek and the lower Missouri. With 85% leakage, large volumes of untreated wastewater are entering the groundwater adjacent to Shotgun Creek, a tributary to the lower Missouri, for which a Total Maximum Daily Load (TMDL) is being developed.

The project also provides conservation, management, and development of renewable resources. Through elimination of excessive leakage and use of spray irrigation, the town will be conserving water while protecting other water sources. The spray irrigation will also be used to develop more than 12 acres of agricultural land. Until the project is complete, there is nothing the town can do to better manage the facilities. The project will allow the town to comply with all federal and state standards.

Applicant Name Beaverhead Conservation District
Project Name Big Hole Ditch Improvement Project

Project Abstract

The purpose of this project is to upgrade Big Hole Ditch and associated irrigation infrastructure. The ditch diverts water from the Big Hole River, an important fishery and a natural and recreational resource in the region. Rock Creek is also intercepted by the ditch.

Big Hole Ditch was constructed in 1918. In the 1960s, Interstate 15 was constructed over and along this ditch. Relocating the ditch is not feasible since it must pass through a 378-foot-long, 42-inch concrete culvert beneath the interstate. In addition, the point of diversion for this ditch has been stable for many decades. Therefore, any changes to that site are not recommended.

Major facilities at Big Hole Ditch include flow control headgates, a flow measurement flume, and excess flow spillways. The control structures are wood timber construction and are approximately 50 years old. Commensurate with their age, the structures are deteriorating to the point where failure may occur if the system is stressed during high water.

Other operational issues with the ditch include:

- Difficulty in controlling fish migration to and from the ditch;
- Lack of control of Rock Creek water;
- Inability to completely dry the ditch for maintenance; and
- Steep embankment near the Big Hole River susceptible to failure.

This project proposes to remedy current operational issues by replacing aging infrastructure and by performing other modifications which will reduce failure risk. When completed, the improvements will allow more effective ditch maintenance and operation.

Additional benefits of completion include:

- Fish passage to the Big Hole River when the ditch is drained;
- Protection of the Big Hole River from embankment failure and resultant sediment load to the river; and
- Enhancement of public safety to recreational users on the Big Hole River.

Applicant Name Beaverhead County
Project Name Blacktail Deer Creek Flood Mitigation Project

Project Abstract

This construction project is designed to replace two limited-capacity culvert crossings with open span bridges and to reconfigure the stream channel to minimize the impact of a 100-year flood event. The county has studied six alternatives and the resulting delineation of the 100-year floodplain for each.

The culverts have caused repeated flooding of a 13-block area along the urban reach of Blacktail Deer Creek. The flooding is caused by the limited capacity of the culvert crossings which have only 62 cubic feet service (cfs) of capacity, while peak discharges for the 10, 50, 100, and 500-year flood flows are calculated at 352, 550, 740, and 940 cfs, respectively. The delineated floodplain contains over 50 residential and commercial structures that are threatened each time the creek leaves its banks, including a seed potato storage facility, a bulk fuel dealer, an apartment complex, motel, church, visitor center, mobile home park, and single-family residences.

The county commissioned a detailed step-backwater analysis for Blacktail Deer Creek using the U.S. Army Corps of Engineers (USACOE) Hydraulic Engineering Center-River Analysis System (HEC-RAS) computer program. The analysis modeled pre- and post-mitigation floodplain development alternatives that will minimize downstream flooding associated with the bridge replacement projects proposed as part of a Federal Emergency Management Agency (FEMA) grant application. The affected stream reach begins at Reeder Street and extends approximately 0.5 miles downstream to the elevated irrigation culvert crossing approximately 250 feet downstream of the Bannack Street Bridge. The project will increase the channel's flood flow capacity, re-establish the stream gradient and sediment-carrying function, reduce the delineated floodplain, and eliminate the debris and ice-lodging problems associated with the culverts. The reconfigured stream channel will reduce potential flooding of residential and commercial development built subsequent to installation of the culverts in the 1950s.

Applicant Name Bitter Root Irrigation District (BRID)
Project Name Dry Gulch Siphon, Phase 3

Project Abstract

The BRID conducted a formal benefit analysis study of the Dry Gulch Siphon project under Phase 2 of the Renewable Resources grant 04-1220. The conclusion is that installation of an underground siphon, irrigating 355 acres, with automated sensors/controls, which will eliminate 2.94 miles of unlined canal, will improve the administration and management of irrigation water, improve infrastructure, enhance water quality, and conserve natural resources. The purpose of this grant, Phase 3, is to implement to construction of the siphon. Implementation will result in the following:

Improved management and stewardship of the renewable resource:

- A total of 2.94 miles of unlined canal will be replaced with a buried pipe siphon and automated sensors/controls;
- An estimated 892 acre-feet of water per irrigation season will be conserved;
- Less diversion from Como Lake and Lost Horse Creek is possible, leaving more for fish, wildlife, and recreation;
- Water quality improvement will be a result of less excess water at the end of the canal system;
- Better tailwater management will reduce sedimentation and erosion in the Three Mile area; and
- Annual operation and maintenance cost-savings of $10,455 could be applied toward other improvements.

Measurable conservation of irrigation water:

- Automated remote sensors/controls will be integrated into the BRID's existing Supervisory Control and Data Acquisition (SCADA) system, and
- Automatic gate position control will be based on the water level/flow at the siphon.

Development and expansion of services:

- A water connection point will be included on the siphon for the Three Mile Fire Department. The Dry Gulch area is not currently served by any underground water distribution system for fire protection.

Citizen benefits:

- Improved services and infrastructure;
- Water conservation;
- Water quality improvement; and
- Benefits to include agriculturalists, fisheries, wildlife, and recreation facilities.

Applicant Name Black Eagle Water and Sewer District
Project Name Water System Improvements Project

Project Abstract

The Black Eagle Water and Sewer District owns and maintains the water distribution system in Black Eagle. The district's water mains include many blocks of original cast iron piping that occasionally break due to corrosion and the brittleness of the pipe. These water main breaks lead to associated health and safety problems.

The main road (Smelter Avenue) through Black Eagle is programmed for reconstruction by the Montana Department of Transportation (DOT) in 2010. The water mains in the reconstruction area are the oldest cast iron mains in the water system. These mains have historically been brittle and broken due to nearby construction activity. These mains must be replaced before the highway reconstruction is finished to minimize future possible damage to the reconstructed roadway.

The system has several problems including:

- Impending roadway reconstruction;
- Failing mains due to age and pipe material;
- Below standard valving and looping;
- Undersized mains; and
- Galvanized steel and possibly lead service lines.

As a result of these problems, Black Eagle needs to replace numerous blocks of its water system to meet modern construction standards. This Preliminary Engineering Report (PER) provides a detailed evaluation of the water system and proposes solutions for the various deficiencies.

The Black Eagle Water and Sewer District will fund many of the improvements from its financial reserves. Because the citizens pay more for water and sewer service than the Montana Department of Commerce (DOC) target rate for communities with their income level, the district is also requesting funding assistance from the Treasure State Endowment Program (TSEP) and the Renewable Resources Grant and Loan Program (RRGL) to complete the necessary improvements.

Applicant Name Brady County Water and Sewer District
Project Name Brady Wastewater System Improvements

Proposal Abstract

This project is a public facilities project involving improvements to the wastewater treatment and collection systems for the community of Brady. The Montana Department of Environmental Quality (DEQ) has stated that the treatment system is out of compliance and is currently being referred to the Enforcement Division of DEQ.

The proposed project will solve several serious problems:

- The treatment system will be re-constructed to allow it to operate as per state requirements for a facultative lagoon thus reducing the discharge of partially or untreated effluent;
- Sludge will be removed; and
- The badly leaking collection system will be replaced.

The proposed improvements to the treatment system will reduce damage to plant and animal species as well as the environment from the discharge of inadequately treated wastewater to a coulee north of the lagoon. The proposed improvements include crop irrigation of the treated effluent. Sludge must be removed from the lagoons applied to the land to meet the U.S. Environmental Protection Agency (EPA) biosolids disposal permit and the Code of Federal Regulations (CFR) Part 503 requirements. The land application of the sludge, as well as irrigation of the treated effluent on agricultural land, provides a beneficial use by providing nutrients and water for crop production. The new collection system is needed in order to reduce the leakage of raw sewage to the groundwater system and prevent the infiltration of groundwater into the collection system.

Applicant Name Buffalo Rapids District 2
Project Name Open Lateral Conversion to Pipeline

Project Abstract

The proposal area covers 11,478 acres of the 45,647 contained within the Buffalo Rapids Project located on 64 miles of the Yellowstone River in eastern Montana.

Buffalo Rapids has two primary concerns: water quantity and water quality. Secondary concerns are soil erosion, noxious weeds, and CO_2 emissions. Current conditions are a 30% overall irrigation water use efficiency; nitrate fraction in excess of 7% in the Lower Yellowstone River near Glendive attributed to Buffalo Rapids; an estimated 10 tons of soil loss per acre from furrow erosion; and 2,100 acres of noxious weed infestation.

Goals and objectives:

- Increase system efficiency by 20%;
- Reduce nitrate loading by 50%;
- Reduce soil erosion to sustainable levels;
- Reduce noxious weed infestations by 75%; and
- Reduce CO_2 emissions by 5,000 tons per year.

The goals and objectives will be achieved by the most efficient and cost effective method of addressing the problem developed through the Natural Resources Conservation Service (NRCS) Resource Management System (RMS) planning for groups involved with laterals and on farm planning. Construction is being done by Buffalo Rapids, which has the means and experience, with technical assistance from NRCS and the U.S. Bureau of Reclamation (USBR). Since the first contracts were funded in October 1998, installations include 210,000 feet of pipe, two weather stations to improve irrigation water management and education, a mile of canal liner, 14 center pivots, 47 surge valves, and over 166,934 feet of gated pipe.

This project involves the replacement of one open lateral with polyvinyl chloride (PVC) pipe. The total cost will be $241,819 with Buffalo Rapids District 2 donating $43,173 in materials, labor, and machine time; NRCS contributing $55,296 in planning, follow-up, and Environmental Quality Incentive Program (EQIP) funds; landowners contributing 43,350; and the Renewable Resources Grant and Loan Program (RRGL) $100,000.

Applicant Name Buffalo Rapids District 1
Project Name Open Lateral 34.5 Conversion to Pipeline

Project Abstract

The proposal area covers 34,169 acres of the 45,647 contained within the Buffalo Rapids Project located on 64 miles of the Yellowstone River in eastern Montana.

Buffalo Rapids has two primary concerns: water quantity and water quality. Secondary concerns are soil erosion, noxious weeds, and CO_2 emissions. Current conditions are a 30% overall irrigation water use efficiency; nitrate fraction in excess of 7% in the Lower Yellowstone River near Glendive is being attributed to Buffalo Rapids; estimated 10 tons of soil loss per acre from furrow erosion; and 2,100 acres of noxious weed infestation.

Goals and objectives:

- Increase system efficiency by 20%;
- Reduce nitrate loading by 50%;
- Reduce soil erosion to sustainable levels;
- Reduce noxious weed infestations by 75%; and
- Reduce CO_2 emissions by 5,000 tons per year.

The goals and objectives will be achieved by the most efficient and cost-effective method of addressing the problem developed through the Natural Resources Conservation Service (NRCS) Resource Management System (RMS) planning for groups involved with laterals and on farm planning. Construction is being done by Buffalo Rapids, which has the means and experience, with technical assistance from NRCS and the U.S. Bureau of Reclamation (USBR). Since the first contracts were funded in October 1998, installations include 210,000 feet of pipe, two weather stations to improve irrigation water management and education, a mile of canal liner, 14 center pivots, 47 surge valves, and over 166,934 feet of gated pipe.

This project involves the replacement of one open lateral with PVC pipe. The total cost will be $209,757 with Buffalo Rapids District 1 donating $60,825 in materials, labor, and machine time; NRCS contributing $28,612 in planning, follow-up, and Environmental Quality Incentive Program (EQIP) funds; landowners contributing $20,320; and the Renewable Resources Grant and Loan Program (RRGL) $100,000.

Applicant Name Bynum Teton County Water and Sewer District
Project Name A New Source of Drinking Water for Bynum

Project Abstract

Bynum is in north-central Montana about 10 miles north of Choteau. Currently, the residents of the community derive their water for domestic uses from individual wells completed in the sand and gravel aquifer underlying the community. However, the sand and gravel aquifer is less than 20 feet thick and susceptible to contamination; in the past, public water supply wells have periodically failed certain drinking water standards. Wells completed in the aquifer are prone to going dry during droughts such as those experienced during the past several years. Drilling deeper wells is not an option because there is about 2,000 feet of shale below the sand and gravel aquifer; the shale generally yields very small quantities of poor quality water. In addition, the average income in the community is $12,600, and any new expense for drilling or treatment would be an economic hardship for some residents. Because the citizens were concerned with the safety and reliability of their water, in 2004 they formed a water and sewer district to begin considering options for dealing with their drinking water supply.

A potential new source of water for Bynum exists in the Virgelle Sandstone. The Virgelle Sandstone crops out in the hills west of Bynum and dips gently to the west. The Virgelle Sandstone yields adequate volumes of good quality water for Sunburst northeast about 75 miles.

Recently, the Bynum Teton County Water and Sewer District retained the services of an engineering firm to develop a Preliminary Engineering Report (PER) concerning different drinking water alternatives. The PER concluded that water from the Virgelle Sandstone would provide the safest source of water at the lowest cost for the residents. Other alternatives included tapping into Choteau's public water supply system or the shallow sand and gravel aquifer underlying the Burton Bench. Developing the sand and gravel of the Burton Bench was deemed risky because this water may be under the direct influence of surface water and susceptible to contamination. Tapping into Choteau's water system, 13 miles south, is too expensive.

The proposed project is Phase 1 of a multi-phased project. Phase 1 activities, for which $100,000 in grant funds are being sought, consist of a comprehensive investigation in which test wells will be drilled about four miles west of Bynum into the Virgelle Sandstone. The goal of this project is to find a safe and reliable source of drinking water in the Virgelle Sandstone for the residents of Bynum.

Specific objectives that will be used to achieve this goal are:

- Identify potential test-well sites;
- Install test wells and document lithology, well construction, and production information;
- Collect water samples for major ion and trace element analyses;
- Prepare a report of findings; and
- Submit a public drinking supply plan and specification application to the Montana Department of Environmental Quality (DEQ) and a water right application to the Montana Department of Natural Resources and Conservation (DNRC).

It is anticipated that the test wells will be drilled to a depth between 200 and 500 feet below land surface. The test wells will be used to locate a permeable section of the Virgelle Sandstone that will yield at least 30 gallons per minute, and to determine the water quality in the formation.

The subsequent phase(s) of the project includes the design and specifications of production wells and the distribution system and is estimated to cost more than $1 million. The U.S. Bureau of Reclamation (USBR) has been identified as a potential source for funding a production well. Other sources of funding are identified in the PER.

The Montana Bureau of Mines and Geology (MBMG) will be the lead agency on the project. The Bynum Teton County Water and Sewer district will also participate.

Applicant Name Carbon Conservation District
Project Name Planning Tools for Developing and Managing Water Resources Near Red Lodge: Phase 1, Hydrogeology and Water Balance of the East and West Bench Aquifers

Project Abstract

This project will collect the data needed to develop a baseline understanding of the hydrogeology and water balance of the aquifers underlying the East and West benches of Rock Creek near Red Lodge. The project results will provide information to evaluate and manage the effects of climate, changes in irrigation practices, and changes in land use on groundwater quality and availability in the alluvial aquifers underlying this area. Residents of this rapidly growing part of Carbon County are dependent on groundwater in alluvial sand and gravel aquifers as the primary, if not the sole, source of water. This aquifer is recharged primarily by flood irrigation and ditch leakage. Decreases in recharge because of drought or changes in irrigation practices or land use will reduce groundwater availability. Additionally, the alluvial aquifer is shallow and vulnerable to contamination, but limited water quality data have been collected in the area.

Only limited groundwater information is available in this part of Carbon County. As part of a preliminary investigation, water levels were monitored in wells underlying the West Bench near Red Lodge. The Montana Bureau of Mines and Geology (MBMG) has recently collected additional data as part of a regional groundwater investigation of Stillwater and Carbon counties. These data sets are extremely valuable because they document background water-level trends and seasonal fluctuations. Unfortunately, the short period of record and limited frequency of measurements are not at the detail required to understand the surface water/groundwater relationships needed to make land-use and planning decisions. Acquiring enough surface and groundwater information to understand the hydrologic balance of these alluvial aquifers is essential for planning and management of this critical and increasingly scarce groundwater resource.

Proposed tasks for the project include conducting an inventory of wells, springs, irrigation ditches, and streams in the area. Dedicated test wells will be installed for measuring water-level fluctuations under different recharge scenarios and for conducting pumping tests to determine aquifer hydraulic properties. Most of the test wells will be located near suspected recharge areas (irrigated fields and irrigation ditches). Seepage runs will be conducted on many of the significant irrigation ditches to quantify irrigation losses, which are believed to be the primary source of recharge to the alluvial aquifer. Products of the project will include detailed maps of aquifer distribution and groundwater availability, groundwater flow, drilling depths, groundwater quality, and nitrate concentrations. The work will ultimately focus on developing a water balance of the alluvial aquifers underlying the East and West benches. A report will be prepared describing the activities and conclusions of the project. All data will be available through the MBMG's Ground-Water Information Center (GWIC) database. Public meetings will be conducted throughout the project to disseminate project information and to gain input and identify concerns.

Applicant Name Chester Irrigation District
Project Name Chester Irrigation Project: Phase 2 – Water Service Contract Application

Project Abstract

The purpose of this Renewable Resources Grant and Loan (RRGL) application is to provide funding to the Chester Irrigation District so it can commence negotiations with the U.S. Bureau of Reclamation (USBR) to obtain a water service contract for the Chester Irrigation Project. The USBR has indicated that, depending on its level of involvement, the cost of meeting administrative, environmental, and regulatory requirements could range from $1.4 million to $3.7 million. If the Chester Irrigation Project is able to move forward, the remainder of the funding to meet the USBR's requirements could be funded by a combination of fee assessments to the members of the Chester Irrigation District; long-term low-interest loans; federal appropriations; and state and federal loans and grants.

This grant would enable the Chester Irrigation District to move forward with Phase 2 of the Chester Irrigation Project. Phase 1, the Preliminary Engineering Design, is scheduled to be completed in September/October 2006. Phase 1 was funded by a $100,000 Renewable Resource grant by the 2005 Montana Legislature. It is anticipated that, at a cost of $1,800 to $2,000 per acre, total cost of the project could be approximately $72 million to $80 million.

The ultimate long-term goal of the Chester Irrigation Project is to provide opportunities for economic development and enhancement of the physical and human environment through development of an irrigation project. This would be achieved by production of high-value crops and development of value-added businesses for the Chester/Liberty County area, the north-central Montana region, and the State of Montana while, at the same time, carefully managing the renewable resources involved in the project.

Ideally, the Chester Irrigation Project could serve as a model for private/state/federal partnerships for development of other irrigation projects in Montana. Development of these types of partnerships would require a substantial investment and a long-term commitment on the part of the private, state, and federal sectors for the development and enhancement of Montana's renewable resources.

Through use of Best Management Practices (BMP), water, air, soils, fish and wildlife, and human renewable resources would benefit from development of this project.

Applicant Name Columbia Falls, City of
Project Name Columbia Falls Wastewater System Improvements

Project Abstract

The City of Columbia Falls proposes a two-phase approach to upgrade and expand its wastewater treatment plant. Phase 1 improvements will mainly replace equipment and structures that are beyond their useful life, improve existing processes to meet regulatory changes, and provide a capacity and service life to 2025 or beyond. The total proposed cost for these improvements is $3.6 million. Phase 2 improvements will further expand the capacity of the facility and improve processes to meet future regulatory changes.

The proposed improvements include:

- Screenings equipment replacement;
- Adding screenings washing and compacting capability;
- Replacing existing grit handling equipment;
- Improving the headworks ventilation system;
- Constructing a new biological nutrient removal process basin to meet future loading and permit requirements;
- Upgrading the existing disinfection system to comply with more stringent regulations and meet future flow requirements;
- Expanding bio-solids storage capacity and developing an alternate means of disposal; and
- Installing a standby generator.

The Phase 1 improvements will preserve the integrity and quality of the Flathead River and Flathead Lake by increasing the treatment plant's ability to remove nitrogen. In addition, installation of ultraviolet (UV) disinfection will remove hazardous chemicals from the river and reduce effluent toxicity.

The improvements will include installation of more energy-efficient equipment and systems that will reduce energy and chemical use at the facility. The improvements will expand the plant's ability to use plant effluent for irrigation and non-potable water use at the facility, reducing the future demand on the potable water supply. Expansion of the bio-solids storage and disposal system will allow for continued beneficial re-use of the facility's bio-solids.

The proposed improvements will allow more dense, urban-type development, which will increase housing availability closer to schools, shopping, employment centers, etc.; reduce sprawl development and commuting time, potentially reducing fuel usage; and potentially reduce housing costs.

Applicant Name Cut Bank, City of
Project Name City of Cut Bank Water Improvements

Project Abstract

The water system serving Cut Bank dates back to approximately 1914 and consists of a water treatment plant, two 1 million-gallon storage tanks, and approximately 123,000 lineal feet of water main. Over 70% of the water mains are 65 years and older and most are undersized. The plant needs to add a backwash pump, flocculator, and sedimentation basin.

The source of water is Cut Bank Creek and it experiences the following deficiencies:

- Rapid changes in turbidity making treatment difficult;
- Very low streamflows that do not yield sufficient water to satisfy community needs so, the city is forced to place severe restrictions on water use and running out of water is possible;
- Existing off-stream storage may not have sufficient capacity to meet demands during low flow events of long duration; and
- Given the catastrophic nature of running out of water, the city believes it must immediately augment its existing raw water storage or find an alternate or back-up supply.

The distribution system experiences the following deficiencies:

- Much of this pipe is old and is four inches in diameter or smaller and corroded;
- Inadequate fire flow which represents a public safety concern;
- Leakage in the distribution system of 96 million gallons;
- High frequency of repair;
- Heavily corroded pipelines encourage the growth of bio-films which harbor bacteria and reduce chlorine residuals presenting a public health risk;
- Heavily corroded lines inhibit adequate pipeline flushing; and
- Low pressures result in backflow and associated contamination.

The proposed solution is to complete improvements in phases. Distribution and treatment improvements will be completed in subsequent phases.

For this grant application the following work will be completed:

- Expand existing off-stream raw water storage by adding a new pond adjacent to existing pond; and
- Add backwash pump.

Applicant Name Darby, Town of
Project Name Darby Water System Improvements

Project Abstract

The Town of Darby plans on building a new 900,000-gallon water storage tank to provide fire protection and sufficient domestic water supply. Over 20,000 linear feet of water main will be constructed or replaced, reducing leaking, providing increased fire protection, and reducing stagnant water at dead-end mains. One new well will be put into service and disinfection systems will be installed to ensure the health and safety of the community.

Darby is the southernmost incorporated municipality in Ravalli County, nestled in the Bitterroot Mountains. The town operates the municipal water and sewer system, police department, court system, cemetery, parks, rodeo grounds, museum, and contracts for town fire protection services.

Miners, fur trappers, and loggers converged into a community that was named Darby by Postmaster James Darby in 1888. Structures along Main Street were destroyed three separate times by fire. Each time, town residents came together and rebuilt the "town," creating a strong sense of community pride and accomplishment. The town became an "Incorporated Municipality" in 1917. Even with the ups and downs of the economy and the mining, fur, and logging trades, Darby has continued to grow through agriculture, ranching, the timber industry, and tourism.

The current water system is beginning to feel its age. The system is almost 50 years old with very few upgrades over the years. The problem is that the town's drinking water system needs a major overhaul. The town's distribution system is leaking almost 70% of the water being pumped, the tank is grossly undersized, and the dead-end mains allow water to become stagnant. After last summer's "boil order" from the Montana Department of Environmental Quality (DEQ), the town decided to aggressively tackle the entire drinking water system.

The proposed solution is to do the following:

- Build a 900,000-gallon water storage tank;
- Construct or replace 200,000 linear feet of water main, thus reducing leakage, providing increased fire protection, and reducing stagnant water at dead-end mains; and
- Put in a new well and install disinfection systems to ensure the health and safety of the community.

Applicant Name Dayton/Lake County Water and Sewer District
Project Name Dayton Wastewater Improvement Project

Project Abstract

The unincorporated Community of Dayton sits on the West Shore of Flathead Lake near the northern end of both Lake County and the Flathead Indian Reservation. The townsite was platted in the early part of the last century and is home to 86 families, a church, restaurant, school, and the largest marina dedicated to sailing boats on the lake. A water and sewer district was formed in 2001 to find a way to confront the ongoing problem of periodic local flooding, causing septic discharges and contaminating the community and Flathead Lake.

The community has no public facilities and depends on shallow wells and direct pipes into the lake for domestic water and individual septic systems for sewage treatment. The platted lots are too small to allow the development of both a well and a septic system on the same lot so residents own three or four lots to get the required space. An impervious clay layer of soil exists, lying from 12 to 50 feet below the surface. This layer narrowly defines the potential treatment layer for septic effluent and tends to channel groundwater from the Dayton Creek drainage and any contaminants directly into the lake without allowing the normal soil treatment of septic that a deeper and less active system offers.

This shallow soil profile and high groundwater due to its proximity to the lake increases the likelihood of periodic local flooding during periods of spring runoff. Unfortunately, much of this flooding often occurs over existing septic drainfields causing effluent to mix with the flood waters and spread throughout the community before draining into the lake.

The district proposes to construct a sewage collection and treatment system. The collection system will consist of 15,000 feet of pipe and two lift stations. The collected effluent will be pumped to a facultative lagoon system, disinfected, and spray-irrigated on 30 acres of crop land.

Applicant Name Deer Lodge Valley Conservation District
Project Name Upper Clark Fork River Habitat, Water Quality, and Restoration Enhancement Project

Project Abstract

The Upper Clark Fork River Basin (UCFRB) encompasses about 3,600 square miles, extending from the headwaters of Silver Bow Creek atop the Continental Divide near Butte to its confluence with the Blackfoot River at Bonner. In its journey, the river runs through some of the most impacted stream and river reaches in Montana. Mining impacts from the legacy of extracting metals in the Butte area to smelting in Anaconda resulted in the largest Superfund site in the United States. Time, cleanup, and restoration have greatly improved the streams and rivers, but much more work still needs to done. Restoring impacted streams and basin tributaries and protecting the local heritage are cornerstones of the Water Resource Council (WRC) mission.

A total of $97,406.50 of RRGL funds are requested for coordination and technical support and to help the WRC work with its many partners. A one-to-one cost-share is provided through the Montana Department of Environmental Quality (DEQ) 319 grant awarded to the WRC for Total Maximum Daily Load (TMDL) planning.

This project provides coordination, management, and technical planning, but is indirectly a construction and implementation effort needed for conserving and restoring natural resources. Coordination between numerous entities conducting projects in the UCFRB is essential in order to identify restoration targets, goals, joint projects, and to ensure a healthy and economically viable ecosystem. To this end, the focus of this project is to identify, target, and implement actions that reduce basin impairment issues and specifically improve main stem and tributary water quality by working with the TMDL program. This grant will fund the technical support needed to oversee development of watershed restoration plans and targets and the work with stakeholders to educate them about the conservation measures implemented.

This is a two-year grant request with goals of improving water quality, soil conservation, and fisheries.

Specific goals include:

- Develop targets through the DEQ-TMDL program needed to improve water quality and identify restoration projects;
- Reduce soil loss on agricultural lands and logged areas through minimizing soil bank erosion and implementation of road Best Management Practices (BMP), as well as reduced nutrient loading from agricultural and municipality sources;
- Improve fishery and aquatic life habitat, recreation opportunities, and protect species of concern; and
- Prepare an action plan that links basin restoration work and TMDL planning.

Applicant Name Montana Department of Environmental Quality (DEQ)
Project Name Geothermal Assessment and Outreach Partnership

Project Abstract

Montana has abundant geothermal resources that could provide heat, food, and electricity for the citizens of Montana. Montana's use of these resources has lagged behind other western states. Although a few spa resorts and greenhouses have tapped some of Montana's geothermal resources over the past century, the vast majority of the energy available from geothermal sources lies undeveloped.

In particular, some of the highest temperatures measured in Montana are in deep oil and gas wells. There is potential to use heat from both producing and non-producing wells for direct uses, or for electricity generation for use near the well sites. While temperature and water chemistry information exists for many of Montana's hot springs and wells, there has been little investigation into the development potential in oil and gas fields.

The DEQ, Montana Bureau of Mines and Geology (MBMG), and National Center for Appropriate Technology (NCAT), which represent the Montana Geothermal Working Group, propose to investigate up to 15 known geothermal sites in Montana for potential development. The MBMG will conduct the data collection and technical evaluation. The NCAT will conduct additional site evaluation and produce a regulatory guide, a geothermal development guide, case studies, and consumer outreach materials. The DEQ and NCAT will coordinate and maintain geothermal websites, and work with owners and managers of geothermal resources to develop new projects using the earth's heat.

Today it is more important than ever to use the renewable resources available in our state, and to use them wisely and to their best advantage. Millions of British Thermal Units (BTUs) of heat are available for cost-effective uses and this project will help Montanans capture that resource.

Applicant Name Montana Department of Natural Resources and Conservation (DNRC), Forestry Division

Project Name Community Tree-Planting Grants

Project Abstract

The goal of the Community Tree-Planting Grants project is to increase the number of urban trees in Montana's communities. This will be accomplished by providing subgrants to Montana cities, counties, and tribes for new tree-planting projects on public lands within municipal boundaries with the goal of increasing present tree population by at least 10%. Trees are a major capital asset and long-term investment in cities and towns. Just as streets, sidewalks, sewers, public buildings, and recreational facilities are part of a community's infrastructure, so are publicly owned trees. Urban trees provide tangible physical, social, economic, and renewable resource benefits to communities. Communities can promote energy efficiency through urban tree-planting and stewardship programs that strategically locate trees to save energy and minimize conflicts with urban infrastructure. These same trees can provide additional benefits by reducing stormwater runoff; improving local air, soil, and water quality; reducing atmospheric carbon dioxide; increasing property values; calming traffic; enhancing community attractiveness and investment; and promoting health and well-being. Trees in the urban environment make Montana communities more livable and thus improve the quality of life for all Montana citizens.

The Montana Urban and Community Forestry (UCF) Program is requesting $100,000 from the DNRC, Renewable Resources Grant and Loan Program (RRGL) to fund tree-planting projects in Montana's communities. Subgrants would be available to communities that demonstrate projects focusing on new tree-planting activities, serve the citizens of their community, involve local volunteers, and provide a 1:1 matching cash and/or in-kind contribution.

The goals associated with the Community Tree-Planting Grants projects as proposed by the UCF program, run parallel to those of the DNRC-RRGL program. Both seek to conserve and protect the quality of Montana's renewable resources in both the urban and rural environment through proper management and further development of Montana's urban renewable resources.

Applicant Name Montana Department of Natural Resources and Conservation (DNRC), Water Resources Division (WRD)
Project Name Middle Creek Dam - Automated Instrumentation

Project Abstract

The DNRC owns 24 high hazard dams. The term “high hazard” indicates the potential for loss of life below the dam, should the dam fail. DNRC maintains a dam safety program at each dam that includes monthly monitoring of reservoir pool levels and embankment instrumentation during the irrigation season and annual dam safety inspections. The intent of the program is to verify that each dam is performing adequately and, as early as possible, identify any potential problems that may be developing. The reservoir pool level data is also used to manage reservoir operations. In the unlikely event of a dam failure, DNRC has an Emergency Action Plan for each dam that specifies actions and available resources for emergency response personnel.

The purpose of this project is to enhance the current dam safety program at Middle Creek Dam: (1) by installing an automated instrumentation system at the dam to improve the ability of DNRC to monitor and evaluate both reservoir operations and embankment performance, and (2) by evaluating the feasibility and cost of installing an early warning instrumentation system that would alert emergency response personnel in the event of a dam failure. Middle Creek Dam was selected due to its importance as a municipal water supply for Bozeman, the relatively large amount of development in the potential inundation zone, and the difficulty of accessing it during the winter.

The funding in this request would be used to automate the existing instrumentation system at Middle Creek Dam and to evaluate the feasibility of an early warning system. The department is requesting a Renewable Resource grant in the amount of $100,000. The State Water Projects Bureau (SWPB) will assume the lead role in project management, intending to contribute in-kind technical services amounting to approximately $37,525. The estimated cost of this project is approximately $137,525.

Applicant Name Montana Department of Natural Resources and Conservation (DNRC), Water Resources Division (WRD)

Project Name Ackley Lake Dam Rehabilitation

Project Abstract

The Ackley Lake Dam is approximately 10 miles southwest of Hobson. The dam is owned by the DNRC, with daily operations and maintenance the responsibility of the Ackley Lake Water Users Association. The dam and canal system were constructed by the State Water Conservation Board in 1938. Water from the reservoir is used for irrigation, recreation, and regulation of streamflows. The reservoir storage capacity at the dam crest elevation is 8,315 acre-feet. Surface area at normal full pool is 260 acres. The drainage area covers 2.6 square miles. Ackley Lake State Park surrounds most of the reservoir and is a popular recreation area, with fishing the most common activity.

The earthen embankment dam is 51 feet high and 3,514 feet long. The reservoir stores 5,975 acre-feet at the spillway crest. The dam is classified “high hazard” under the Montana Dam Safety Act guidelines because of the potential for loss of life below the dam, should failure occur.

A feasibility study for Ackley Lake Dam was prepared in 2006 to present designs, design options, and costs for rehabilitating the existing seepage control measures and outlet conduit of the dam. In the toe area of the dam, artesian pressures have been measured that are well below applicable safety standards. Both the original drains and outlet conduit were constructed with metal pipe with corrosion protection (galvanized and tar coating). However, given the age of the project, these pipes are probably nearing the end of their design life.

Project rehabilitation will consist of installation of new drains and a toe berm to control the seepage and construction of a new outlet conduit to replace the existing, deteriorating structure. Repair work and improvements will enhance dam safety and longevity and promote effective water conservation for irrigation needs, recreation, and fisheries enhancement.

The funding in this request would be used to help pay for rehabilitation construction costs. The DNRC WRD is requesting a grant in the amount of $100,000 and a loan in the amount of $200,000 from the Renewable Resource Grant and Loan Program (RRGL) to contribute to the overall project. Additional funding sources include a $1,132,486 Executive Planning Process (EPP) budget request from the Water Storage and Hydropower Account and approximately $87,257 from the DNRC in-kind contributions. Estimated total cost of the project at the feasibility stage is approximately $1,519,743.

Applicant Name Montana Department of Natural Resources and Conservation (DNRC), Water Resources Division (WRD)

Project Name Smith Creek Canal Seepage Abatement and Rehabilitation

Project Abstract

The Nilan Water Project (NWP) is owned by the DNRC and operated by the Nilan Water Users Association. The project originally comprised a 10,092 acre-foot, off-stream reservoir, a 5.5 mile-long supply canal, and three delivery canals, totaling 23.5 miles in length. The storage water carried by the supply canal is provided by two sources, Smith Creek and Ford Creek. The Smith Creek branch of the supply canal is 3.7 miles long. Construction of the original project was completed in 1951, and ownership of the 16.5 mile-long Florence Canal was transferred to the Water Users in 1995.

Water from the project provides lifeblood for agriculture, fish and wildlife, and recreation. It irrigates ranch and farmland; recharges the flow of two local streams, Smith Creek and Elk Creek; supports local wildlife habitat; provides fisheries for rainbow and brown trout; and offers a recreational resource to boaters, hunters, and fishers.

Due to deterioration from age, slope instability, and insufficient repairs, the Smith Creek branch of the Supply Canal now requires substantial rehabilitation. The right bank of the canal failed after the spring runoff in 2005, and it was shut down for the remainder of the irrigation season. The canal requires considerable work to repair.

When measured in May 2005, the canal lost 22% of its water at low flows; a higher loss is assumed at full flow. This considerable quantity of water is lost through the pervious canal channel. In addition to causing the slope failure, seepage from the canal also floods hay fields and adversely affects private property in other ways. To compound these problems, the drastic water shortages suffered by the Water Users during the eight consecutive years of drought have brought some ranchers and farmers to the brink of bankruptcy. The Nilan Water Users wish to stem the loss of water from the Smith Creek Supply Canal, stop the damage, and return this precious resource to beneficial use.

In order to address these concerns, the DNRC State Water Projects Bureau (SWPB) proposes to rehabilitate the canal by (1) installing canal lining on the most pervious reaches of the canal and (2) fortifying the canal against slope failure by applying shotcrete on the left inner side slope. These measures will rehabilitate the Nilan Water Project's infrastructure, protect private property, and conserve water.

For these reasons, the DNRC-WRD is requesting a grant of $100,000 and a loan of $50,000 to rehabilitate the Smith Creek Supply Canal, and thereby prevent seepage, protect private property, and conserve water for more beneficial use to landowners and the general public.

Applicant Name Montana Department of Natural Resources and Conservation (DNRC), Water Resources Division (WRD)

Project Name East Fork Siphon Replacement and Main Canal Lining Project

Project Abstract

The Flint Creek Water Project (FCWP) is owned by the DNRC and operated by the Nilan Water Users Association. The project originally comprised a 16,040 acre-foot off-stream reservoir and five delivery canals, totaling 46.6 miles in length. The storage water carried by the supply canal is provided by the East Fork Reservoir. The Main Canal, which feeds all the four other delivery canals, is 7.7 miles long. Construction of the original project was completed in 1939. The transfer of ownership of all of the delivery canals, except the Main Canal, from the State to the Flint Creek Water Users Association is pending.

Water from the FCWP irrigates nearly 38% of the land under irrigation in the Philipsburg Valley. Consequently, the economy of the region is linked to serviceability of this project.

Water from the project provides lifeblood for agriculture, fish and wildlife, and recreation; it irrigates ranch and farmland, recharges the flow of Flint Creek, supports local wildlife habitat, provides trout fisheries, and offers a recreational resource to hunters and fishers. It gives refuge to the bull trout, a federally listed endangered species, and to the west slope cutthroat trout, a “species of special concern.”

Due to deterioration from age, slope instability, and insufficient repairs, the East Fork Siphon on the Main Canal now requires substantial rehabilitation. The siphon ruptured in June 2001, and it was shut down for repairs. Each subsequent year, additional repairs have been undertaken, including patching of corrosion holes and replacing straps on a concrete anchor block. Shutdown during critical irrigation times can have a deleterious effect on crops.

Measurements in July 2004 verified that the Main Canal lost nearly 13% of its flow between the headgate and the siphon and nearly 20% end to end. A considerable quantity of water is lost through the highly pervious canal prism. The Flint Creek Water Users wish to stem the loss of water from the Main Canal, stop the damage, and return this precious resource to beneficial use.

In order to address these concerns, the DNRC, State Water Projects Bureau (SWPB) proposes to rehabilitate the canal by (1) installing canal lining on the most pervious reaches of the canal and (2) fortifying the canal against slope failure by applying shotcrete on the left inner side slope. These measures will rehabilitate the FCWP’s infrastructure and conserve water.

For these reasons, the DNRC-WRD is requesting a grant of $100,000 and a loan of $400,000 to replace the East Fork Siphon and line the Main Canal, and thereby prevent seepage, protect private property, and conserve water for more beneficial use to landowners and to the general public.

Applicant Name East Bench Irrigation District (EBID)
Project Name East Bench Irrigation District – Canal Lining

Project Abstract

The EBID is located near the Town of Dillon. The district is requesting funds through the Renewable Resources Grant and Loan Program (RRGL) for design and construction of canal lining in the main irrigation canal. The goal of the project is to provide EBID with an irrigation infrastructure improvement that will conserve water resources and increase crop yields. This project was conceptualized by EBID as the first step in long-range planning and modernization efforts, and was initiated through an RRGL planning grant.

In compliance with RRGL requirements, an engineering study was undertaken to investigate the existing infrastructure and operational controls of EBID and evaluate irrigation system alternatives. The primary recommendation of the study is to install liner in 1,175 feet of the main canal so the district can conserve water resources, reduce canal seepage, and increase crop production. Currently, there is not enough irrigation water to satisfy the crop water consumption requirements. The seepage loss is about 10 cubic feet per second (cfs) or 20 acre-feet per day, or 2,585 acre-feet annually. A direct consequence of the water shortage is a reduction in crop yields of over 1,293 acres. The result: an estimated annual revenue loss to the community of approximately $387,900.

Implementation of the proposed project will potentially result in significant economic benefit to the community. Improved canal efficiency and decreased canal seepage will increase irrigation delivery and will allow EBID to provide more water to water users during the most critical time of the irrigation season. If increased water supply through improved canal efficiency can increase annual revenue by 50%, the additional $193,950 in revenue will potentially generate an additional $678,825 to $1,357,650 in annual economic activity.

Applicant Name Ekalaka, Town of
Project Name Ekalaka Water and Wastewater Improvements

Project Abstract

The Town of Ekalaka is submitting a grant application to the Montana Department of Natural Resources and Conservation (DNRC) for a project to replace the following water and wastewater deficiencies:

- Replace water and sewer mains that run parallel to each other down the Main Street of Ekalaka;
- Update the controls in the main lift station;
- Replace a single pump lift station;
- Replace the water main that runs from the storage reservoir to town; and
- Replace an old fire hydrant that is made of four-inch cast iron lead.

The project presented in this DNRC application represents one of many long-term, comprehensive solutions to correct defined deficiencies and provide renewable resource benefits.

The renewable resource benefits to this project are as follows:

- Replacing the water mains that are 70-plus years old will save on water usage for the town. (Page 1 of the Preliminary Engineering Report (PER) notes several water main breaks in the last two years and that the mains being replaced are made of cast iron and are severely pitted.)
- Replacing the sewer mains that are 70-plus years old will alleviate ground contamination. (Page 2 of the PER notes a television report that two tapped service lines intruded into the sewer main and at least 200 feet of the existing main spalling.)
- Replacing the single pump lift station will alleviate surface water contamination. (Page 2 of the PER notes that this lift station has had several float system problems causing sewage to back up and overflow into Russell Creek and back up into two homes.)
- Replacing the controls in the main lift station will help in management efficiency and again alleviate contamination due to sewer blockage and overflows. (Page 2 of the PER documents several false alarms with the paging system and sewer backups that have resulted in several insurance claims.)
- Updating the electrical and control problems of the lift stations will free maintenance workers for other things. (Uniform Environmental Checklist, No. 15, Social Services.)
- Updating the electrical and control problems of the lift stations will improve the efficiency of both stations. (Uniform Environmental Checklist, No. 18, Energy Resources.)
- Replacing the existing four-, six-, and eight-inch cast iron water mains to six- and eight-inch PVC water mains and replacement of one four-inch cast iron hydrant to a six-inch PVC will increase the water flows, a positive impact for fire protection. (Uniform Environmental Checklist, No. 24, Fire Protection.)

Applicant Name Elk Meadows Ranchettes County Water District
Project Name Elk Meadows Water System Improvements

Project Abstract

The Elk Meadows Ranchettes County Water District is located in western Montana, roughly 20 miles west of Missoula. The district's water system currently utilizes two wells which provide water to 55 existing homes. Other components of the system include three small tanks, an 110,000-gallon storage tank, 16,600, lineal feet of water main, two booster stations, and seven fire hydrants. The water is disinfected with chlorine and a corrosion inhibitor added before distribution.

The primary deficiencies associated with the Elk Meadows water system pertain to the health and safety issues caused by an inadequate supply of water for domestic and fire protection needs. The system cannot provide sufficient water during high demand periods and there is no redundancy provided by the wells, given the limited capacity of each well. The district lacks adequate water rights to meet existing and anticipated maximum demands. The water supply is corrosive and violates regulatory standards for copper, creating a public health hazard. The distribution system, in part, is undersized and does not have meters on service connections. The water storage tanks in the system are inadequately sized.

The proposed solution includes the development of water resources by the construction of two new wells. A hydrogeological study is included in the project to locate an adequate source of water and obtain needed water rights. Water resources will be conserved after installation of water meters, which are included in the project scope. Reduced water use will also conserve energy required for the booster pumps and a reduction in chemical use is also anticipated. The existing 110,000-gallon storage tank will be expanded to allow additional volume to better utilize existing water resources. An aeration system is proposed to reduce the corrosiveness of the water and preserve the utilization of the existing groundwater resources. A portion of the existing water mains will be replaced to allow for better flow capacity. The distribution system will also be looped to improve system hydraulics and maintainability.

Applicant Name Fergus County Conservation District
Project Name Upper and Lower Carter Pond Dam Repair

Project Abstract

This proposal is to rebuild the dams of 24-acre Upper Carter Pond and 28-acre Lower Carter Pond to current specifications. The dams are located about six miles north of Lewistown. Each dam will store about 140 acre-feet after project completion.

Work was last done on the dams in the 1980s. In July 2004, the upper dam had a slow failure due to pipe corrosion; it is now about eight feet below normal pool. Early in 2004, the trickle tube on the lower dam collapsed, but the dam did not fail. The Montana Department of Natural Resources and Conservation (DNRC) recommended repair or breach of both dams.

The project is a cooperative effort between a private landowner; local, state, and federal entities; and Ducks Unlimited to re-establish a fishery, waterfowl habitat; and recreation area at Upper and Lower Carter ponds. Each pond has a Montana Department of Fish & Wildlife Parks (DFWP) fishing access site. The dams and most of the shoreline are privately owned, but a walk-in public easement surrounds both reservoirs. The upper pond site has been developed with a latrine, gravel boat launch, and picnic tables. The lower site is not developed. Fishing pressure is substantial with about 1,600 angler-days each year. A rural fire hydrant that serves 200 to 300 people is located at Upper Carter Pond. It is currently not functioning due to low water.

The conservation district is seeking grant assistance of $100,000 to match other funds being raised for the $360,133 dam repair project. This project will ensure continued operation for fisheries, waterfowl habitat, recreation, storm water retention, and stock watering. The project should lead to establishment of a healthy riparian area surrounding the ponds.

Applicant Name Fort Peck Tribes
Project Name Fort Peck 58 Main Check Structure Replacement for Water Management

Project Abstract

The Fort Peck Tribes and Fort Peck Water Users Association are working on improving the Fort Peck Irrigation Project. The proposed project will address issues of water conservation, water management, and farm land preservation in the area, downstream from the 58 Main Check Structure.

Check Structure 58 is in immediate danger of failure so it is not being used. The 58 Main Canal Spill Structure is being used as the check, leading to excessive amounts of spill water. Based on the information provided by the Fort Peck Water Users and Bureau of Indian Affairs (BIA) ditch riders, approximately 3,000 acres depend on the main canal structure and facilities. Without a properly functioning 58 Main Check Structure, it is nearly impossible to divert water down adjacent laterals. In addition, continued use of the spill structure as a check structure will most likely lead to failure of the spill.

Four objectives are addressed by this improvement:

- Conservation of irrigation water;
- Increase of water supply for irrigation-classified tracts without suitable water supply;
- Supply of water for idle irrigation tracts; and
- Improved management of 58 main canal facilities.

The proposed project is an important part of the improvement of the Fort Peck Irrigation System. Better management and increased water supply will allow farmers to retain beneficial use of irrigated lands. This will generate income from farming, which, in turn, has the potential to stimulate the area's economy.

Applicant Name Fort Peck Tribes
Project Name D-4 Drain Water Conservation Improvements

Project Abstract

The Fort Peck Tribes and the Fort Peck Water Users Association are working together to improve the beneficial use of the Fort Peck Irrigation Project. The proposed project will address issues of water conservation, water shortage in the eastern portion of the Wolf Point-Frazer Unit, and drainage issues in the area of Drain D-4.

Drain D-4 empties into the Missouri about seven miles west of Wolf Point immediately after it passes underneath Lateral 42-M, carrying significant flow throughout the irrigation season. This project seeks to impound the flow of Drain D-4 with a riprap dam just before it empties into the Missouri and pump it back into Lateral 42-M. Drain D-4 has good storage potential at this location and only minor earthwork will be necessary. Preliminary studies show that at continuous pumping rates of an average of 10 cubic feet per second, approximately 1,800 to 3,600 acre-feet of water per year will be conserved within the Fort Peck Irrigation Project.

Major objectives addressed by this improvement include:

- Conservation of irrigation water for reuse;
- Increase of water supply for irrigation-classified tracts without suitable water supply, providing for better management of the system, and preserving the beneficial use of those farm lands;
- Supply of water for development of additional irrigated tracts currently idle; and
- Preservation of Missouri River water quality by reducing or eliminating agricultural drainage.

The proposed project is an important part of the improvement of the Fort Peck Irrigation System. Increased water supply will allow farmers to convert idle land to irrigated lands and to retain the beneficial use of currently irrigated lands. This will generate a greater revenue stream from farming, which, in turn, has the potential to stimulate the area economy.

Applicant Name Gallatin County / Hebgen Lake Estates RID 322
Project Name Hebgen Lake Estates Wastewater Improvements

Project Abstract

Hebgen Lake Estates is on the southern shore of Hebgen Lake just five miles north of West Yellowstone. The community consists of 183 households and is served by a small sewer collection system with a lift station that pumps raw wastewater to a single-cell aerated lagoon, with effluent to groundwater by infiltration cells. The existing lagoon leaks over 2 million gallons of wastewater annually, the aeration does not work, and the nearby monitoring wells demonstrate the presence of nitrates in the groundwater in excess of the state water quality standard of 10 mg/l. This is also a federal and state drinking water standard. The lift station is more than 20 years old and has failed once, resulting in raw sewage overflows on the ground within the community. Because of the condition of existing facilities and the exceedance of the groundwater quality standard in a monitoring well, the Montana Department of Environmental Quality (DEQ) issued a violation letter to Gallatin County in 2003. A consent order was negotiated between Gallatin County and DEQ in November 2005, and a strict compliance plan and schedule have been developed that call for compliance by October 2008.

After detailed analysis of all available alternatives, it was apparent that rehabilitation of the existing facilities would not allow compliance and that construction of new facilities was necessary. The preferred alternative is aerated wastewater treatment lagoons, followed by storage ponds with effluent disposal by irrigation on crops. This solution will completely solve the problem by significantly reducing the pollution of groundwater resources and will result in compliance with the DEQ order. Total project cost is $2.77 million.

Applicant Name Glacier County Conservation District
Project Name Marias River Bridge Road Stabilization

Project Abstract

Bank erosion on the Marias River near Pugsley Bridge and erosion on Cut Bank Creek near Sullivan Bridge are destroying two streambanks and their adjoining roads within the Marias River Watershed (MRW). This application will fund a Preliminary Engineering Report (PER) on two separate sections of Marias River waterways. While in two separate locations, and requiring two separate solutions, they will both be managed as one project to take advantage of the bargaining power in negotiating contracts and project management coordination.

Sullivan Bridge Road on Cut Bank Creek

The proposed project will address the issue of excessive sediment deposit in Cut Bank Creek. The bank-cutting action is combined with spring runoff, cloudbursts, and other rainfall events to create extensive erosion of Sullivan Bridge Road. The sediment is entering Cut Bank Creek approximately 0.3 of a mile before it joins Two Medicine River at the confluence of the Marias River in the southeast corner of Glacier County.

This erosion is cutting deep channels in the banks and washing away the streambank so the narrowing road has become a safety hazard. Farmers and ranchers use this road for access to land and communities on both sides of the rivers. Erosion is also depositing large quantities of sediment into the mouth of the creek and its confluence with the Marias River. The problem is compounded by a sharp, 90-degree bend in Cut Bank Creek that contributes to river bank deterioration.

An alternative analysis was completed by a consulting engineer in April 2006 and provided the MRW with suggested solutions to the erosion. The MRW-Technical Advisory Committee (TAC) has chosen to move forward with the alternative of installing in-stream structures to manipulate the channel's geometry and flow.

Pugsley Bridge Road

Pugsley Bridge is located on the Marias River, 4.43 river miles downstream from Tiber Dam and Lake Elwell in Liberty County. The bridge is historically significant as one of the few remaining steel cable suspension bridges in the United States, and is an important link for landowner and recreational access to that area of the Marias River.

The river flow around the north support of the bridge is creating downstream erosion of the riverbank that parallels the road. Sediment buildup immediately below the bridge is creating an island with the potential for changing the location of the river channel.

An alternative analysis was completed in April 2006 by a consulting engineer. Based on the engineer's analysis, the MRW-TAC has selected the preferred alternative for each project. Funds are being requested to complete the next step in the process by completing the preliminary engineering field work and design to produce a geomorphological analysis, reference reach analysis, environmental analysis and develop construction designs and specifications for each of the sites. Additionally, a project manager will be contracted to research and secure funds necessary to complete the remaining construction phase of the projects and to develop the organizational structure for coordination of the current and future project tasks.

Applicant Name Goodan-Keil County Water District
Project Name Goodan-Keil Water System Improvements

Project Abstract

The Goodan-Keil subdivision was developed in 1978. It is approximately four miles west of Missoula, north of the junction of Interstate 90 and Airport Way. In August 2004, the Goodan-Keil residents elected to form the Goodan-Keil County Water District to oversee the provision of water service. Currently 81, homes are on the public water system, with a maximum build-out of 87. There have been two significant improvements to the water system: booster station (1999), and construction of a replacement well (2004). The purpose of these improvements was to enhance the district's water supply.

The Goodan-Keil public water system has serious deficiencies that prevent an adequate quantity of water from being delivered to homeowners. Very low pressures are regularly experienced during the irrigation season and the potential for negative pressures is high. One fundamental problem is that the existing storage tank is grossly undersized with only 31% of the district's average daily demand plus minimum fire demand. Next, the booster station frequently fails due to its reliance on an inefficient phase converter for power. Also, the well field piping and supply line from the well field to the booster station were poorly constructed and have ruptured on numerous occasions in the past five years. Finally, the distribution system does not have enough hydrants to provide adequate coverage for all homes within the district. The district is also interested in replacing all the original water meters with newer, remote-read meters.

The proposed $1,079,500 project would provide for a new 150,000-gallon concrete storage tank, extension of a three-phase conductor and conversion of the booster station to three-phase power, 2,000 lineal feet of new six-inch" diameter supply piping, 270 lineal feet of new 2-inch diameter well field piping, seven new fire hydrants and valves, minor wellhead protection improvements, new meters for all 81 users, and an automated meter reading/billing system. The improvements project would effectively correct the current problems with the water system.

Applicant Name Green Mountain Conservation District (GMCD)
Project Title Crow Creek Restoration Project

Project Abstract

The goal of the Crow Creek Restoration Project is to improve water quality and restore native fish populations in Crow Creek, a tributary to Prospect Creek, which flows into the Clark Fork River near the community of Thompson Falls, Montana. The project is located on public land in the Lolo National Forest.

Our project focuses on a section of Crow Creek where almost all riparian (streamside) vegetation was removed during construction of power lines. The removal of vegetation has significantly impacted the stream's ability to function properly, including instability of the streambanks, over-widening of the channel, increased erosion, and reduced stream shading. Two invasive weed species now make up the majority of riparian vegetation, which has further diminished proper functioning of the stream. The proposed project will restore this section of Crow Creek by reconstructing the stream channel, implementing streambank stabilization measures, and replanting the riparian area.

Because Crow Creek contains pure strain bull trout (listed as threatened under the Endangered Species Act) and west slope cutthroat trout (designated as a Species of Special Concern by the State of Montana) and currently lacks non-native fish competitors, it is a high priority for native fish protection efforts in the lower Clark Fork River system. The Prospect Creek Watershed Assessment recommends restoration of the stream channel and riparian area at the Crow Creek site as one of the highest priorities in the Prospect Creek drainage. The Lower Clark Fork River Drainage Habitat Problem Assessment ranks the Crow Creek site second for restoration out of 40 sub-watersheds in the entire lower Clark Fork Basin.

While the Crow Creek project will result in site-specific benefits at the project site (approximately two acres), the project will also result in reconnecting healthy stream and riparian habitat upstream and downstream of the site, thereby re-establishing a corridor for native fish and improving overall fish habitat and water quality in the Crow Creek watershed (approximately 9,000 acres) and the Prospect Creek drainage (approximately 112,000 acres).

The following partners are participating with GMCD in this project: U.S. Forest Service (USFS), U.S. Fish and Wildlife Service (USFWS) (in consultation with the USFS on endangered species benefits), Montana Department of Fish, Wildlife & Parks (DFWP), the Prospect Creek Watershed Council, the Lower Clark Fork Watershed Group, and Avista Corporation.

Applicant Name Greenfields Irrigation District
Project Name Muddy Creek Wastewater and Erosion Reduction

Project Abstract

The Muddy Creek Wastewater and Erosion Reduction Project will take approximately 30 cubic feet per second (7,200 acre-feet) of water currently being wasted at two sites into Tank Coulee, tributary of Muddy Creek. After entering Muddy Creek from Greenfields Irrigation District drains, it will be pumped back into canals to be reused for irrigation. Flow fluctuations and tailwater is the key to reducing erosion in Muddy Creek. This flow reduction should help reduce Muddy Creek erosion by 30%, from 30,000 tons annually to 21,000, based upon flow and sediment studies over the past five years. The bigger erosion effort by the Muddy Creek Task Force will actually reduce sediment loads by more than 50% to 15,000 tons, when combined with the other Muddy Creek projects. Because of natural erosion, the remaining 15,000 tons is estimated to be the lowest possible sediment load, so this next set of projects should be the last of the major erosion control projects on Muddy Creek.

Applicant Name Hamilton, City of
Project Name Hamilton Wastewater Treatment Facilities Improvements

Project Abstract

The City of Hamilton's Wastewater Treatment Facilities Improvements Project will expand and upgrade existing facilities to meet water quality requirements address replacement of aging equipment, and meet growth requirements.

These improvements include:

- Installing a new mechanical bar screen;
- Installing a second dissolved air flotation thickener unit;
- Installing additional vacuum bio-solids dewatering;
- Replacing the existing engine generator and electrical service entrance equipment;
- Installing a non-potable water pumping station at the wastewater treatment plant; and
- Installing a radio-based telemetry station at each wastewater pumping station not currently monitored.

The total proposed cost for these improvements is $3,100,000.

The recommended improvements will allow the Hamilton facility to treat wastewater to a much higher standard than is currently available. The proposed improvements, focused for the Renewable Resource grant, include installation of a new non-potable water supply that will enable the city to significantly reduce the facility's reliance on the city's potable water system. The non-potable water pumping system will allow reuse of treated wastewater for chlorination and other treatment processes within the facility. The result will be an immediate conservation of nearly 800,000 gallons per month from the city's domestic water supply. In addition, the other proposed improvements will allow denser, urban-type development, further eliminating septic systems and providing upgrades to the aging community system and allowing more efficient and less wasteful use of water.

This project will also benefit Montana's renewable water resources by preserving and protecting water resources from contamination. Hamilton's drinking water source is its sole source aquifer, an unconfined system that allows surface contamination to pass into this water source. Converting aging systems that have shown failures and connecting septic and other on-site community systems to a central wastewater treatment plant is the only way to protect the waters of the Hamilton community.

Applicant Name Hill County
Project Name Beaver Creek Dam Seepage Control Berm

Project Abstract

This project seeks to mitigate seepage problems on the right abutment at Beaver Creek Dam by installing a seepage control berm. The dam is not in compliance with current standards for blowout (upheaval) or for exit gradient (piping). A seepage control berm will bring the dam into compliance with state standards and provide long-term protection from seepage related piping of embankment materials.

Beaver Creek Dam was planned, designed, and partially funded by the Natural Resources Conservation Service (NRCS). The planning, design, and construction of the reservoir were authorized under authority of the Watershed Protection and Flood Prevention Act (PL-566). The dam and reservoir were completed in 1974. The dam is owned, operated, and maintained by Hill County. This structure was planned for multi-purpose uses and is utilized for flood prevention, irrigation, recreation, and fish and wildlife.

Seepage has been a persistent problem in the right abutment area since construction of the dam. High foundation uplift pressures have also been documented. The sinkhole was subsequently repaired; however, seepage and high pressures remain. According to the Department of Natural Resources and Conservation (DNRC) Dam Safety Section, blow out and progressive piping failure are possible and could occur catastrophically with little or no warning. Failure of the dam would cause extensive damage downstream to state highways, railroads, dwellings, and businesses in the Havre area.

In 2005, DNRC issued an operational permit for the dam with the condition that the seepage problem be addressed before 2009. Failure to meet the condition could result in the reservoir level restriction. If the level restriction was implemented, usable storage capacity at the reservoir could be reduced from 3,600 acre-feet to 1,200 acre-feet or less.

Applicant Name Hysham Irrigation District
Project Name Main Ditch Improvements

Project Abstract

The proposal area covers 6,165 irrigated acres in the Yellowstone River Basin in Treasure County. Irrigation water is pumped from the Yellowstone River with three 350 hp electric pumps. The primary concern is to deliver more water to users in the lower part of the district. A portion of the lower main ditch does not have adequate water transmission capacity during the high water demand growing season. At present, the three pumps deliver more water than a segment of the lower main ditch can handle; thus, some of the water is spilled back into the river. At present, up to 20% of the pumped water is spilled back into the Yellowstone River because of this undersized ditch. This is a waste of electric energy and also downgrades river water quality.

The primary purpose of this project is to increase the ditch carrying capacity 30%, by increasing the volume that can be carried in it. By increasing the ditch capacity, it will give the lower ditch users adequate water, and they will also be able to bring an additional 135 dry land crop acres under irrigation. It will also generate more farm income, increase the tax base for Treasure County, and reduce the electricity cost per acre for the users. Electricity is the largest single expense for the district. Last year, the electric bill was $53,186 or $8.67 per acre. This project will result in the district making better use of the water it pumps. It will not result in the district pumping more water. Present district crop value is about $4.7 million. With the proposed improvements, crop value should increase to $4.85 million.

Applicant Name Jordan, Town of
Project Name Jordan Wastewater System Improvements

Project Abstract

The Town of Jordan constructed the original sewer system in 1951; the existing lift station, force main, and lagoons were added in 1968. Deficiencies in the system were identified in the Preliminary Engineering Report (PER) prepared by a consulting engineer and adopted by the town.

The PER noted several deficiencies in the sewer system in Jordan:

- The lagoons currently discharge treated wastewater to Big Dry Creek. The discharge permit includes both interim and final effluent limitations. The discharge must comply with the final effluent limitations by April 1, 2009, but the existing system cannot meet the final limits;
- The lagoon embankments have extensive erosion from wind and ice formations; and
- The control structures for routing wastewater between the cells are either significantly deteriorated or altogether inoperable. Original construction materials for the control structure are also not compliant with current regulations.

Deficiencies noted with the existing lift station include:

- An overflow in the wet well discharges raw sewage into Big Dry Creek during power outages in direct violation of the Montana Water Quality Act. Current regulations require removal of the overflow and installation of an emergency power source;
- The wet well/dry well design presents a health and safety hazard to town personnel by creating a confined space in the dry well; and
- The lift station itself is old and nearing the end of its useful life. The steel shell of the dry well is extensively corroded and may be structurally unsound. The dehumidifier no longer works, and performance of the bubbler control system is erratic.

Concerns noted in the collection system include:

- Large sections of the collection system were originally constructed with slopes and pipe diameters less than the minimums required by current regulations; and
- Town personnel have documented four damaged areas of the collection system during routine maintenance.

The PER summarizes recommended improvements to include:

- Reconfiguring and reconstructing the existing lagoon system into a three-cell facultative lagoon that is properly sized to enhance treatment;
- Continued discharge of treated wastewater into Big Dry Creek;
- Construction of a new lift station with submersible pumps and an above-ground control building; and
- Replacement of a damaged section of the collection system.

Applicant Name Judith Basin County Water and Sewer District
Project Name Geyser Water System Improvements

Project Abstract

The Geyser Judith Basin County Water and Sewer District operates a public water system which serves the community of Geyser, approximately 35 miles southeast of Great Falls. The district provides water service to 44 residences and nine commercial or institutional users including the school, post office, and senior citizens center.

The district completed a Preliminary Engineering Report (PER) in 2002 which identified deficiencies in the water system. To address these system deficiencies, the district recently completed a water system improvements project. The project added a new storage tank and transmission main, replaced a majority of the distribution system, added water meters to each service connection, and completed a new water supply well.

Unfortunately, the new water supply well was not successful. A test well constructed within 20 feet of the production well had previously indicated that a sufficient quantity of water was available. However, due to variances in the sandstone formation, the new supply well did not produce the amount of water needed for the water system.

The proposed project will construct another new water supply well, this one immediately adjacent to the previously constructed test well. Based on the testing completed previously, it is apparent that water of sufficient quality and quantity can be obtained at the test well location and will meet the district's needs.

Construction of a new water supply well will develop and expand the utilization of a natural resource and also preserve the renewable resource benefits that the water system currently provides.

The project will solve serious health and safety problems and enhance the common well-being of Montanans through development and preservation of resource benefits from water, a renewable resource.

Applicant Name Lewis and Clark County
Project Name Lewis and Clark Fairgrounds/Dunbar Area Water Improvements

Project Abstract

The Lewis and Clark Fairgrounds/Dunbar Area Infrastructure Study (2004) was undertaken to analyze the existing infrastructure and define potential solutions that will address the growing concern for aging and inadequate water and wastewater systems. This study presented a plan for water and wastewater improvements in the area that includes the Lewis and Clark Fairgrounds, the Woodlawn Park Addition, and the Associated General Contractors (AGC) Training Facility. A number of problems have been identified including failing septic systems, inadequate fire flows, and unacceptable nitrate levels in water wells. Construction of wastewater improvements to the area (Phase 1 of the project) is under way. Funding for this phase is through the Treasure State Endowment Program (TSEP) and State and Tribal Assistance Grant (STAG), State Revolving Fund (SRF) loans, fairgrounds mill levy, a rural improvement district formed in the Woodlawn Park Addition, and through private funds.

The Lewis and Clark Fairgrounds/Dunbar Area Water System Upgrade Preliminary Engineering Report (PER) updates the water improvements portion (Phase 2 of the project) of the infrastructure study.

The following conclusions were drawn in the PER:

- Wells in the Woodlawn Park Addition and the AGC Training Facility are at risk for contamination. Failing septic systems are one of several contributing factors;
- The fairgrounds water system does not provide adequate fire flows for protection of the facility;
- Lack of a central water system within the Woodlawn area and AGC property reduces the firefighting capabilities of local fire departments;
- Growth potential for Woodlawn Park Addition, the AGC Training Facility, and the fairgrounds are all limited in their potential for growth due to their current water infrastructure; and
- Proximity of the study area to the City of Helena water system makes improvements to the infrastructure relatively simple and cost effective.

Proposed improvements would provide improved water quality and quantity and would allow for future economic growth of the Lewis and Clark Fairgrounds/Dunbar area.

Applicant Name Livingston, City of
Project Name Glass Pulverizer for the City of Livingston

Project Abstract

The City of Livingston is requesting a Renewable Resource Grant in the amount of $100,000 to purchase a glass pulverizer, construct a building in which it would operate, and assist in the implementation of a glass re-use program. The city has committed $108,284 to support the project.

The project will improve Livingston's ability to manage the amount of solid waste disposed of in landfills. The project is designed to divert, at minimum, 191 tons of glass per year from landfills and re-use it locally as glass cullet for infrastructure projects.

The city is proud to put forward a project that implements efforts to achieve solid waste management goals detailed in the Montana Integrated Waste Management Act (75-10-801, MCA) and the Montana Integrated Solid Waste Management Plan. The overall goal of the act and the plan is to reduce, by 25 %, the volume of solid waste either disposed of in landfills or incinerated.

Montana Integrated Solid Waste Management Plan specifically states that re-use is preferred over recycling, landfilling, and incineration as a solid waste management method. The plan details the following re-use goal for Montana: Every community will have an active re-use program.

By reusing glass bottles, jars, windshields, windows, dishware, and other glass products in the form of glass cullet, a material similar to natural aggregate, the city will decrease the need for aggregate mining. The compactability and permeability of glass cullet gives it technical advantages over gravel, especially for drainage systems, base course materials, and backfill applications. The filtration rate of glass cullet makes it an optimum component in reducing non-point source pollution. By decreasing the need for aggregate mining and reducing non-point source pollution, the glass re-use program will also protect fisheries and wildlife habitat.

Applicant Name Loma County Water and Sewer District
Project Name Loma Water System Improvement Project Phase 1

Project Abstract

The Loma County Water and Sewer District provides water to the unincorporated community of Loma and 71 rural water users in northern Chouteau County. The Loma water system draws its water from the Marias River, and then treats the water through a package water treatment plant. The system has approximately 119 miles of various sizes of distribution lines. The sizes range from six inches to one inch, with 42% of the lines being one inch. Fifty-seven percent of the system utilizes glue joints, with the remainder using gasketed joints.

An engineering firm completed a Preliminary Engineering Report (PER) for the district's water system. The report showed that the water treatment plant is capable of meeting the current surface water treatment rule and is providing good quality water to its users. However, the engineer has identified several deficiencies which will hamper the district's ability to meet future Safe Drinking Water Act (SDWA) regulations. Currently, the district is a member of the North Central Montana Regional Water Authority and will need to decide if they will participate in the Rocky Boy's/North Central Montana Regional Water System. If they elect to join, then the treatment plant improvements are not necessary.

In the past four years, the district had over 307 repairs with 99% directly connected to polyvinylchloride (PVC) glue joint failure. The estimated leakage range is 100 to 250 gallons per capita per day (gpcd) or 26,000 to 52,000 gallons per day. It is estimated that 20% to 40% of the water is unaccounted for with the current system.

The district is proposing to phase in the improvements, with the first phase addressing 90% of the one-inch glued joint distribution lines and installation of water meters.

Applicant Name Malta Irrigation District
Project Name Dodson North Canal Regulating Reservoir
Project Abstract
The Malta Irrigation District is part of the Milk River Project and contains 42,492 irrigable acres. Water is supplied to these acres through a diversion dam at Dodson on the Milk River, which feeds into the Dodson South and Dodson North canals. Dodson South supplies water for irrigation, Bowdoin National Wildlife Refuge, and Nelson Reservoir, which stores water for the Malta and Glasgow Irrigation districts. Dodson North supplies water for the Malta and Dodson irrigation districts.

A Water Conservation Plan is in place and one of the identified projects that would conserve a considerable amount of water: a 261 acre-foot gravity flow-regulating reservoir on Dodson North Canal.

It takes seven days for water from Fresno to reach Dodson Dam; other irrigation districts, pumpers, and Dodson Irrigation District all take water at the same time. A regulating reservoir would allow the district to hold water so that we could adjust to the fluctuation of the Dodson North Canal. This canal is about 28 miles long and this fluctuation causes a domino effect to everyone irrigating below it. If water could be held, in a reservoir on this canal, releasing water in a timely manner would conserve approximately 1,138 acre-feet of water per year. Another plus to this proposal would be the fact that this would be a gravity flow reservoir, so no machinery or pumps would be required.

By creating a small regulating reservoir, habitat for wildlife, a migratory stop for birds, and possible recreational opportunities would be provided.

Applicant Name Manhattan, Town of
Project Name Manhattan Water System Improvements

Project Abstract

The origin of the Town of Manhattan's water system dates back to 1912 with the installation of asbestos cement and wood stave piping to supply water to the town. Upgrades to the system include wells installed in 1956, 1965, and 2001, as well as replacing wood stave piping and certain sections of asbestos cement piping with polyvinylchloride (PVC) pipe.

Today the water system falls below the standards established by the state for public water systems. The system has restrictions in water flow and no storage capacity, creating inadequate fire flows to the school and business district. The system is susceptible to viral and bacterial contamination created by lack of backflow prevention. Currently, the absence of water meters at individual services creates a strain on the system due to excessive usage. Dependence on manual control of the system is also draining on the supply source and a serious safety concern when the operator is absent or otherwise unable to operate the system. Alternatives were considered and compared to determine the best overall solution for Manhattan.

The preferred group of alternatives includes:

- Installation of two new storage tanks, one paid for directly by development impact fees and the other incorporated as part of the Preliminary Engineering Report (PER) identified project;
- Installation of backup power with automatic transfer capabilities at each source;
- Installation of a telemetry system for the entire water system;
- Construction of a fence around the chlorination house; and
- Installation of water meters with backflow prevention devices on all services.

Improvements to Manhattan's water system will benefit and protect the town and its water supply. Installing backflow prevention devices on each service will protect the system from backflow contamination. Water meters will contribute to water conservation and identification of leaks throughout the distribution system. Addition of water tanks and telemetry will give the system reliability and increased flows to provide safe, adequate fire protection to the whole town, especially to the school and business district.

Applicant Name Meagher County Conservation District (MCCD)
Project Name Hydrologic Investigation of the Smith River Watershed

Project Abstract

This project is an investigation of the groundwater and surface water interaction within the Upper Smith River watershed, a tributary of the Missouri River. The Smith River is an important recreational and agricultural area, located in Meagher and Cascade counties in west-central Montana. Irrigation is the cornerstone of this area's agricultural and economic well-being. Tourism is also important to the economy of the area and the State of Montana, with thousands of visitors traveling to the area annually to float and fish the nationally renowned Smith River.

The MCCD has local responsibility to assess the local natural resources and to oversee their proper management. The MCCD believes strongly that these decisions should be based on scientific information, not perception and/or emotion. The information from this hydrologic investigation is necessary to determine and predict the cumulative impacts that changes from wild flood irrigation to sprinkler irrigation and other water uses will have on the hydrologic system in the Upper Smith River watershed. The investigation will also determine if the use of groundwater for sprinkler irrigation is resulting in reduced flow in the Smith River. The MCCD will carry out this project through a partnership with the U.S. Geological Survey (USGS).

This project would result in increased understanding of the overall hydrologic system. It will help state and federal agencies, along with the concerned public, to better understand the interaction of ground-water/surface water, an important component when determining allocation of water in the area. The ability to determine if groundwater is or is not "immediately or directly connected" to surface water is a critical component when determining the allocation of water by Montana law.

Information from this study will enhance the conservation, proper management, and development and/or preservation of our limited water resource. The information from this study will benefit agriculture, fish and wildlife habitat, associated outdoor-based recreation, and health and human safety.

Applicant Name Milk River Irrigation Project Joint Board of Control (JBOC)
Project Name St. Mary Canal, Halls Coulee Drop 3, Plunge Pool Concrete Repair

Project Abstract

For almost 95 years, the St. Mary Diversion of the Milk River Project has served to augment the Milk River water supply. The St. Mary Diversion provides an important renewable resource to residents along the Milk River. The St. Mary Diversion was built by the U.S. Bureau of Reclamation (USBR) to provide supplemental irrigation water along the Milk River, but has evolved into a multi-use project. The St. Mary Diversion supplies water for 120,731 Milk River Irrigation Project acres, nine municipalities, and Bowdoin National Wildlife Refuge. It provides numerous other fish, wildlife, and recreation benefits.

The USBR operates and maintains the St. Mary Diversion. The distribution system is well beyond its design life and many of the appurtenant structures need to be repaired. Five concrete drop structures near the downstream end of the canal provide a combined drop of approximately 214 feet to the North Fork of the Milk River. The drops vary in length from 130 feet to 330 feet. Each drop consists of an inlet, a chute, and a plunge pool.

The drops are numbered 1 through 5 from upstream to downstream. Of the five drops, the plunge pools associated with Drops 2 and 3 are in the worst condition. The Drop 3 plunge pool is thought to be a slightly higher priority because there is a hole through the left wingwall.

Using Renewable Resource Grant funds, the JBOC, in cooperation with the Montana Department of Natural Resources and Conservation (DNRC) and USBR, wishes to contract for planned repairs to the Drop 3 plunge pool.

Augmentation of the Milk River water supply is vital to conserving the Milk River water supply and preserving the agricultural-based economy of Montana's Hi-Line.

Applicant Name Mineral County Saltese Water and Sewer District
Project Name Saltese Wastewater System Improvements

Project Abstract

Saltese is an unincorporated community in northwestern Mineral County, approximately 10 miles east of the Idaho/Montana state line along the Interstate 90 corridor. The community is currently served by on-site wastewater treatment and disposal systems consisting of standard septic tanks and drainfields. Local residents and businesses rely on individual wells as their sole source of potable water. Well depths in the community are shallow, with 70% of wells having a static water depth of less than 15 feet. Approximately 83% of the lots within the district are 0.25 acres in size or less. Because of the small lot size it is difficult, if not impossible, to find sufficient space to locate replacement drainfields and maintain proper separation between property boundaries and individual drinking water wells that serve each home. In some cases, existing septic tanks and drainfields are submerged in groundwater or at the water table elevation. It is also suspected that many of the older septic tanks leak. Mineral County has indicated that development within the community utilizing on-site septic systems for lots less than 0.50 acres will not be allowed.

The proposed project will include construction of a standard gravity collection system. The new collection system will include an eight-inch polyvinyl chloride (PVC) sewer main, concrete manholes, and a four-inch PVC sewer service pipe. The collection system will be designed to deliver the wastewater to a raw sewage lift station; then the sewage will be pumped to a common septic tank. All existing septic tanks will be abandoned. The proposed treatment process will utilize one common septic tank to provide primary treatment of sewage before discharge of effluent to groundwater via a dosed drainfield. The treatment site is outside the floodplain, with adequate depths to groundwater for required treatment and disposal.

Applicant Name Missoula County Lolo RSID 901, Phase 2
Project Name Lolo Wastewater System Improvements

Project Abstract

The Lolo RSID 901 (Missoula County) Wastewater Treatment Plant (WWTP) Phase 2 Improvements Project will expand and upgrade existing facilities to achieve the following:

- Provide redundancy for critical treatment plant components to reduce the chance of discharging substandard treated effluent into the Bitterroot River;
- Reduce the number of septic systems installed in Missoula County by expanding available capacity, thereby protecting downstream water quality; and
- Increase capacity of the biological system and provide enhanced nutrient removal

These improvements include: providing standby emergency power generation; modifying and adding facilities to provide advanced nutrient removal membrane bioreactor process and capacity for future conditions; and constructing new systems to comply with increasing chlorine disinfection regulations. The total proposed cost for these improvements is $3,607,000.

This project will benefit Montana's renewable water resources by preserving and protecting water resources from contamination. Recommended improvements will allow the Lolo WWTP to treat wastewater to a much higher standard than is currently available. Incorporating the use of membrane filtration produces an effluent which can be beneficially reused throughout the community.

Proposed improvements will encourage denser, urban-type development, which will further eliminate septic systems and provide upgrades to the aging community system, which will allow water to be used more efficiently and less wastefully.

The source of Lolo's drinking water is its sole source aquifer, an unconfined system which can be contaminated from the surface through septic systems and other pollutants. The ultimate preservation of the quality of the Missoula aquifer and the Clark Fork River Basin relies on reducing the effluent that is not being adequately treated by current systems. Connecting these systems to a central wastewater treatment plant is the only way to protect the waters of the Lolo community.

Applicant Name Montana State University (MSU)
Project Name Channel Response Assessment for the Upper Blackfoot

Project Abstract

The Helena National Forest (HNF) has committed to fully restoring ecosystem function to the floodplains in the Upper Blackfoot Mining Complex. As the focus now turns to concerns over the fate of Mike Horse Dam and the ensuing restoration, it is more important than ever to fully understand the nature of the stream system. Upstream and downstream from Mike Horse Dam, floodplain ecosystem function is the product of centuries of natural variation in hydrology followed by decades of human changes in flow regime. The goal of this project is to assess the ecological response potential of floodplains associated with Mike Horse Dam. Two questions pertain to the Upper Blackfoot: (1) How can stream ecosystem restoration be maximized; and (2) how can risk of further contamination be minimized? The temporal and spatial contexts of the stream reaches will be used to classify their potential ecological response to changes in flow regime induced by dam construction, breach, and hazard reduction. Historic aerial photographs from 1938 (pre-construction), 1961 (post-construction), 1966 (pre-breach), 1979 (post-breach), 1995 (post-breach), and 2005 (pre-removal) will be used to track channel, floodplain, and riparian vegetation cover. Topographic surveys of flood stage indicators (flood scars and deposits) and valley-wide crosssections will be used to model Hydraulic Engineering Center-River Analysis System (HEC-RAS) past hydrologic events with step backwater and time varying techniques. From the historic ecological response classification, responses will be predicted to the proposed dam hazard reduction. To test this prediction, topographic, hydrologic, and biological data will be collected at the same locations before and after action on Mike Horse Dam. An evaluation of floodplain ecological response based on its spatial and temporal context within the watershed will distinguish dynamic reaches from stable reaches. Armed with this information decision makers can maximize restoration potential and minimize risk to contaminated sediment.

Applicant Name Neihart, Town of
Project Name Neihart Water System Improvements

Project Abstract

The Town of Neihart provides domestic water for 95 residential and three commercial customers. The original 1890s era water system is being systematically brought up to current health and safety standards. Recent improvement projects include: 1980 – 100,000-gallon water tank, 1981 – reservoir dam reconstruction, 1987 – various water main replacements, 1996 – surface water treatment facility, 1997 – U.S. 89 water main replacement, and 2004 - installed water meters. However, serious deficiencies remain in the water treatment and distribution systems.

The water distribution main, extending 4,200 linear feet from Neihart's surface water treatment plant to U.S. 89, consists of 113-year-old cast iron pipe with caulked lead joints that have numerous documented leaks. This main has had frequent breaks and associated health and safety problems. For example, the town was without water for two to four days when this main broke during a cold snap several years ago. Additionally, the main is now fully exposed where it crosses Belt Creek and is highly susceptible to freezing and flood damage. This main will be replaced and the Belt Creek crossing restored to natural conditions.

Neihart has been under either a boil order or a health advisory due to problems with water treatment since its surface water treatment plant was installed in 1996. A modification to the controls and chemical feed is proposed to help correct the treatment plant problems.

Neihart's water system is heavily in debt and has virtually no reserve fund. Over 60% of residents have low and moderate income levels (LMI); 22% are at poverty level. Part-time residents pay full-time monthly water bills, $40 per month, which exceeds the target rate for Neihart's water service by more than 75%. Because of these challenges, Neihart is requesting funding assistance from the Renewable Resource Grant and Loan Program (RRGL), Community Development Block Grant Program (CDBG), and Treasure State Endowment Program (TSEP) to complete the necessary improvements.

Applicant Name North Powell Conservation District
Project Name Blackfoot Drought and Water Conservation Project

Project Abstract

The Blackfoot Challenge (BFC) has engaged in drought management and water conservation in the Blackfoot watershed since 2000. In early 2006, the BFC began looking at ways to expand and further define irrigation efficiency in the basin. Funding is needed to carry out ongoing drought management efforts and to further develop a long-term water conservation program. As part of these efforts, conserving energy and increasing water use efficiency in irrigation systems is critical to keeping producer operational costs down, which helps preserve agriculture land use. As part of project implementation, the BFC felt that its ongoing drought management efforts, as well as general coordination of basin restoration activities, would be critical to ensure success. These findings led the BFC to pursue this grant application.

The North Powell Conservation District and the BFC are co-sponsoring this project to:

- Implement drought response in the basin;
- Complete energy audits and maintenance evaluations to identify energy and water conservation measures in irrigation systems;
- Expand and improve ongoing soil moisture monitoring;
- Develop specific water conservation projects for implementation and inclusion in the Blackfoot Watershed Restoration Action Plan (Action Plan) and demonstrate restoration successes through long-term monitoring; and
- Provide management, coordination, and development services for new actions in the Blackfoot watershed.

Water and energy conservation are cornerstones of protecting the basin and its rural inhabitants. A total of $84,346.80 of Renewable Resources Grant and Loan (RRGL) funds would be used to provide technical and coordination support for the BFC Action Plan and Long-Term Water Conservation Strategy that is implemented in partnership with the Big Blackfoot Chapter of Trout Unlimited, Montana Department of Fish, Wildlife & Parks (DFWP), U.S. Fish and Wildlife Service (USFWS), National Center for Appropriate Technology (NCAT), Natural Resources Conservation Service (NRCS), Blackfoot landowners, and many others.

Applicant Name North Valley County Water and Sewer District (NVCWSD)
Project Name North Valley County Water System Improvements

Project Abstract

The community of St. Marie, formerly known as the old Glasgow Air Force Base, is 17 miles north of Glasgow. After the base closed, the property changed hands several times and eventually reverted to Valley County. The water and sewer infrastructure is maintained by the NVCWSD.

The district has been repairing mains, services, hydrants, and valves on an as-needed basis each year, realizing that some day a major reconstruction project would be needed to replace the 1950s vintage infrastructure.

Much of the old Air Force Base has been abandoned. At this time no commercial buildings are occupied and the community has evolved into a retirement community.

The district purchases water from the Montana Aviation Research Company (MARCO), a subsidiary of Boeing. The MARCO maintains the runways; uses the facility for airliner flight testing; and operates the water treatment plant, which supplies treated Missouri River water to the MARCO and the St. Marie community. Flows to St. Marie are metered through a master meter.

The NVCWSD owns the water service up to and including the meters in the basements of the units.

The North Valley County water system has several deficiencies, as noted in the Preliminary Engineering Report (PER).

The distribution system was designed and constructed in the 1950s to accommodate an air force base. Many of the units were never occupied and the water distribution system was never tested under civilian usage and maintenance. The lines are not uniform. They range from six inches to 10 inches in diameter. Some are buried seven feet from the surface and some up to 17 feet from the surface. The mains were sized for the original air force base population of approximately 10,000, with a strong commercial economy.

The water mains are asbestos cement pipe (AC) material. The residential units are typically fed through a three-inch AC line tapped with up to four 0.75-inch copper services. There is only one shut off on the three-inch line which means up to four residents could be without water if only one 0.75-inch service requires maintenance.

When the base closed, the as-builts of the infrastructure disappeared. Therefore, the district has had difficulties maintaining the water system when main sizes and service line locations are unknown.

Isolation of the service lines has been very difficult. For instance, one housing unit may have one occupant who is gone for the winter, whereas the other occupants use water year round. The service to the idle user cannot be shut off at the curb stop since one service feeds up to four occupants. During the winter, heat tape is used for these instances, but frequently the frigid temperatures cause the idle service to break and flood the basement.

For example, a service break occurred and the curb stop could not be located easily. The break was traced by monitoring the flow into the sanitary sewer lift station. By the time it was found, the St. Marie reservoir and one MARCO reservoir were emptied.

The following summarizes the deficiencies in the system:

- Difficulty of finding both small and large water breaks – 22 breaks have occurred since 1993;
- Several hydrant and valve repairs – 18 repairs since 1993;
- Several dozen service line breaks since 1992;
- Isolation difficulty on the mains and services; and
- Increased flows to the wastewater treatment pond due to basement flooding.

All customers are metered separately. The meters are in the basements of the units with a hard wire readout on the exterior of the building. The district has had difficulties accessing the meters for maintenance and to verify that they have not been bypassed.

There is no Supervisory Control and Data Acquisition (SCADA) system available to monitor elevation in the reservoirs. Elevation of the water in the reservoirs is measured at standard temperature and pressure with a pressure gauge.

The PER summarizes the recommended improvements and considers the cost to residents of St. Marie. If all work were to be completed in one phase, the cost would be prohibitive for the community. Therefore, the project engineer is recommending the district forego the new water meters and the SCADA system at this time and focus its attention on the distribution system. Other items are addressed in the Capital Improvements Plan.

Applicant Name Panoramic Mountain River Heights County Water District
Project Name Panoramic Mountain River Heights Water System Improvements Project

Project Abstract

The Panoramic Mountain River Heights Water District was formed in 1975 and operates a community water supply system. The district's water supply capacity and distribution system is grossly inadequate to meet the community's needs and results in the district experiencing low water pressure on a regular basis during the summer. Some users have reported that their showers completely stopped flowing. The water system consists of two wells with pumps, controls, and hydropneumatic pressure tanks. The distribution system consists of 1.5-inch, two-inch, and three-inch substandard quality polyvinyl chloride (PVC) pipe. In addition, the water services in this community are not metered, leading to excessive use on some services. Low pressure may result in contamination of the drinking water due to backflow. Backflow into the water system is a severe threat to public health and safety and is recognized by the U.S. Environmental Protection Agency (EPA) as one of the most significant threats to public water supplies in the United States.

The district proposes to install an additional well and pump system capable of providing enough water to meet the community's peak demands. The substandard and undersized distribution main will be replaced with modern six-inch diameter PVC pipe that will carry adequate water flow at minimal head losses. The community supports installing water meters on each service to help promote water conservation. The project will solve serious health and safety problems and enhance the common well-being of Montanans through the conservation, management, development, and preservation of the district's public water system.

Applicant Name Petrolia Irrigation District (PID)
Project Name Petrolia Irrigation Rehabilitation Project

Project Abstract

The PID is in Petroleum County, about seven miles southeast of Winnett. The PID is requesting funds through the Renewable Resources Grant and Loan Program (RRGL) for the design and construction of canal lining in the main irrigation canal. The goal of the project is to provide the PID with an irrigation infrastructure improvement that will conserve water resources and increase crop yields and benefit recreational uses on Petrolia Reservoir.

In compliance with the RRGL requirements, an engineering firm conducted a field review and survey in October 2005 and January 2006. Canal structure, erosion, siltation, and seepage were also inventoried. The primary recommendation of the study is to line a portion of the canal with a geomembrane canal liner which will provide stabilization and control leakage of irrigation water. Currently, an estimated 600 acres of land have been put out of production or have decreased production rates due to the saline seep and leakage of irrigation water from this portion of the canal. The annual crop loss because of lost production has been estimated at approximately $136,500.

Implementation of the proposed project will potentially result in a significant economic benefit to the community. Also, higher rates of water storage from year to year in Petrolia Reservoir will benefit the recreational industry in this area. The reservoir is used heavily by fishing, boating, and camping enthusiasts from across the state. Improved canal efficiency and decreased canal seepage will increase irrigation delivery and allow the PID to provide more water to the users during the most critical time of the irrigation season.

Applicant Name Philipsburg, Town of
Project Name Philipsburg Wastewater System Improvements

Project Abstract

The sewer system consists of a gravity collection system, a two-cell, 12.4-acre facultative lagoon system for treatment, and a gravity outfall main between the collection system and the lagoons. The entire collection system functions by gravity. The lagoons discharge to Flint Creek, a tributary of the Clark Fork River, where new stringent nutrient standard and load limits are proposed.

The Town of Philipsburg currently serves a total of 550 sewer service connections, approximately 465 of which are residential. The total population served by the municipal system is estimated to be 941.

Philipsburg's need for an estimated $6.6 million in wastewater facility improvements is driven by a number of factors including:

- Proposed Total Maximum Daily Load (TMDL) limits and in-stream standards on Flint Creek for nitrogen and phosphorous so stringent that tertiary wastewater treatment will be required, significantly increasing the cost to treat the town's wastewater;
- Pending renewal of the town's Montana Pollutant Discharge Elimination System (MPDES) permit, adding effluent ammonia limits unattainable with lagoon-based treatment resulting in escalating violations of MPDES permit limits;
- Existing lagoon deficiencies, including accumulated biosolids and pre-1990 stormwater sediments, and inadequate hydraulic detention time (capacity);
- Excessive gallons per capita per day (gpcd) water consumption and wastewater generation (244 gpcd), unduly diluting sewage flows, and potentially inflating the size and cost of new wastewater treatment works;
- Seasonal groundwater infiltration into collection system outfall piping;
- Anticipated increased demands on the system due to escalating real estate sales, population growth, and housing development within and around the community; and
- Remedy of the identified system deficiencies is of high priority for the town to protect residents' safety and welfare, and to eliminate public health and environmental threats in the area.

The goal is to achieve wastewater facility improvements as remedy for the system's deficiencies. However, the projected costs for the identified improvements far exceed the community's current financial abilities. Therefore, the town needs to determine the concise magnitude of improvements necessary; and it is working closely with the Montana Department of Environmental Quality (DEQ) in a process of setting the in-stream water quality standards and subsequent TMDL limits for Flint Creek. The town will first verify the current wastewater gpcd flow with the installation of water meters and then prepare a rate study, for an anticipated cost of $575,557. These actions will provide a means to conserve water usage, thereby reducing wastewater flows. Reduced wastewater flows will result in reduced operation and maintenance (O&M) cost at the treatment plant and also ensure that the overall plant improvements project not be over designed, thereby minimizing the overall financial burden to the community. The project will benefit all households within Philipsburg equally as all residents have access to the municipal facility.

Applicant Name Pinesdale, Town of
Project Name Pinesdale Water System Improvements

Project Abstract

The water system for the Town of Pinesdale has been constructed over time with minimum planning and no consideration for fire protection, leading to serious deficiencies with the existing public water system.

During the 2000 wild fire season, fires burnt to the edge of town, destroyed four structures, and required evacuations. During the fires, the treatment plant was shut down so that raw water could be diverted to the irrigation system to help meet fire-fighting needs. Because of the inadequate water storage system, the town had little water in reserve. Because of the very limited storage system, undersized water mains, and limited fire hydrants, the town had no residential fire protection. Had the fire advanced much farther to the east, the entire town could have been lost.

The Pinesdale water system currently has the following deficiencies:

- Inadequate water storage; and
- Inadequate fire protection storage.

The town's current water supply is inadequate to supply the growing town's residential and fire protection needs. The town has water rights from Sheafman Creek. The town also has three wells: two that supply irrigation water, and one for household use. The town has recently drilled 40 different sites in an attempt to secure another well, but has been unsuccessful in finding water.

The average demand is 114,500 gallons per day; with a fire flow demand of 2,500 gallons per minute for a duration of two hours, the required storage would be 414,500 gallons. The existing water storage facilities are not adequate.

The distribution system experiences pressure extremes. Some areas in the system have very high pressures, while other areas have very low pressures.

System problems that need to be addressed within the water distribution system include:

- Lack of fire hydrants;
- Undersized mains to supply water to fire hydrants; and
- Dead-end water mains.

Because of budgeting restrictions, the town will complete this project in two phases.

Phase 1 is immediate and will involve the following corrections to the water system:

- Removal of the existing southwest tank;
- Installation of a new tank adjacent to the existing water treatment plant;
- Installation of pressure-reducing valves throughout the distribution system;
- Installation of a water line from the new tank to the location of the existing southwest tank; and
- Addition of three new hydrants to the system.

Phase 2 will be completed in the future, and involves the following corrections to the water system:

- Replacing four-inch mains with six-inch or larger mains;
- Adding blow offs to dead-end water mains; and
- Installing a water metering system.

Applicant Name Polson, City of
Project Name Polson Water System Improvements

Project Abstract

The City of Polson manages a complex water system which utilizes a system of groundwater wells and storage reservoirs to supply water to three primary pressure zones. The city has made recent improvements to the water system, including a 1 million-gallon concrete storage tank and two new wells constructed in 2001, on the west side of the Flathead River. Despite the recent improvements, population growth in the area and deteriorating infrastructure continues to impact the city's ability to provide adequate water quantity to satisfy demand. This situation is compounded by the fact that two of the existing water storage tanks, constructed in 1922, are in need of immediate replacement. These storage tanks exhibit severe deterioration, including spalling concrete, exposure of rebar, and the potential for complete failure. The tanks serve the lower pressure zone which includes most of the eastern downtown commercial area.

Water system modeling demonstrates that the lack of available storage during peak demand periods and restrictions in the distribution system piping are impacting the city's ability to provide sufficient water supply for fire protection in certain areas of the city. A substantial potential for property loss exists since Polson High School is in an area of low water availability. One area of town located near the highest storage reservoir has very low operating pressures and needs a booster station.

The proposed project is to replace the deteriorating storage tanks and preserve the ability to retain water resources for domestic and fire protection needs. Adequate storage will also allow the community to develop. With multiple pressure zones in the community, having adequate storage in each pressure zone allows the city to properly manage the water supply to meet required demand. The new booster station will limit the public health and safety hazard associated with inadequate water pressure. The new main and fire hydrant will help provide adequate water to fight fires at the high school.

Applicant Name Pondera County Conservation District
Project Name Marias River System Improvements

Project Abstract

A Compilation and Evaluation of Baseline Information report by the Montana Bureau of Mines and Geology (MBMG) (November 22, 2005) for the Liberty County Conservation District and the Montana Department of Environmental Quality (DEQ), states:

"The greatest obstacle to describing water-quality and water-quantity in the Marias River watershed is the paucity of area-wide, time-coincident data. Several good investigations of surface-water and ground-water resources have been conducted over the past four or five decades, but only one has included the entire watershed: a report sponsored by the Montana Department of Health and Environmental Services in 1975. Far too many changes in-land and water-use have taken place to rely on 30 year old data regardless of its quality. The U.S. Geological Survey (USGS) gauging stations provide the only long-term surface-water data in the watershed. As discussed, only one station on the main stem of the river has a period of record for water quality beyond a few years; the collection of that data ceased nearly 20 years ago.

"Without area-wide surface-water and ground-water data, evaluation of the watershed is limited to investigations whose scope was limited with respect to area, amount of data, or type of data. Regardless of the quality of data, there is very little overlap in time and it is an ill conceived approach to compare these types of data across time. A scientifically sound and defensible evaluation of any watershed requires a comprehensive, concurrent effort of data collected. Equally important, the evaluation requires concurrent, seasonal data from both surface-water and groundwater coordinated with a good understanding of the ground-water - surface-water flow paths. Such data are lacking in the Marias River watershed; the proposed plan for collecting concurrent surface water and ground-water data, both quality and quantity is critical for a better evaluation."

In 2005, the Marias River Watershed (MRW) technical coordinator and the Department of Natural Resources and Conservation (DNRC) watershed specialist began a detailed on-the-ground riparian assessment and sampling project of Pondera Coulee (74 river miles) and the upper mainstem of the Marias River above Lake Elwell and below the dam to the Circle Bridge (78 river miles).

The stream corridor assessment was to:

- Evaluate the fluvial geomorphology of the Marias River and Pondera Coulee to determine how channel behavior has responded to natural processes and human influences. Data will be collected to help understand the extent and impacts of the following: noxious weed infestations, streambank erosion, transportation corridors, streambank stabilization measures, and in-channel infrastructure (irrigation, stream crossings, etc.);
- Evaluate how riparian vegetation characteristics are related to channel types and land management practices;
- Provide various historic and current Geographic Information System (GIS) layers of stream corridor features that will serve as a baseline for monitoring trend over time; and
- Identify opportunities for improving and maintaining stream channel stability, riparian plant community health, and fish habitat. The assessment will provide information to assist in determining priority projects and to support future requests for technical and financial assistance for stream corridor projects.

The objectives of this grant request are:

- Provide a sound baseline of current watershed status by completing a two-year follow-up to the 2005 data collection on the Pondera Coulee and Marias River;
- Develop baseline data for the Dry Fork Tributary;
- Purchase monitoring equipment for local watershed data collection;
- Provide local data collection training;

- Develop a locally maintained web-access database of water quality information; and
- Establish a long-range plan for consistent and credible monitoring.

Applicant Name Power Teton County Water and Sewer District
Project Name Power Teton Water System Improvements

Project Abstract

The Community of Power is an unincorporated town in eastern Teton County, approximately 25 miles northwest of Great Falls. The district provides water service to 65 households and 14 commercial or institutional users including the school, post office, and the senior citizens center.

The community's original water treatment facility was outdated and did not provide treated water to meet the U.S. Environmental Protection Agency (EPA) regulatory requirements. A pilot study and a Preliminary Engineering Report (PER), including an alternatives analysis, led to an overall project consisting of three phases. Phase 1 included construction of a new conventional package treatment plant, clearwell storage tank, backwash basin, and appurtenances. Phase 2 included construction of a new presedimentation basin, an on-grade storage tank, and partial replacement of the distribution mains.

The district's remaining water mains, constructed in 1969, are at the end of their service life and do not provide adequate fire flows. Several dead ends remain in the system and prevent adequate flushing or cleaning, leading to the possibility of contamination of biofilms. The transmission main from the treatment plant is of unknown condition. Metal screws have been used to plug leaks in the main. It is suspected that this main is currently leaking, so the new treatment plant must process extra water.

The proposed Phase 3 addresses the above deficiencies along with those not mentioned here. The project provides resource conservation, development, management, and preservation.

The community has been extremely active in its support of this project. Each user is now paying an additional $61 in their monthly bill to repay loans incurred from Phases 1 and 2. The estimated cost to complete the project is $805,714.

Applicant Name Rae Water and Sewer District
Project Name Rae Water System Improvements

Project Abstract

The Rae Water and Sewer District is supplied by four groundwater wells, which are operated by a collection of large hydropneumatic tanks near the center of the district. The hydropneumatic tanks provide a cushion for the surges that would otherwise be created by the activation and deactivation of pumps through the system. The effective storage quantity is negligible for these tanks and all peak hourly demands must be met by the wells. The existing distribution system consists of four-inch, six-inch, and eight-inch polyvinyl chloride (PVC) pipe. The King Arthur Trailer Court is served entirely by four-inch lines, with considerable leakage.

As determined in the Preliminary Engineering Report (PER), the district's water system has the following deficiencies:

- Lack of storage: The district has a complete lack of water storage;
- Lack of centralized control system: The expanding district will soon have five independent wells for which control and management is time consuming, and with no quick indication of failures. The district has run out of water an average of one or two times per year, leaving the system open to contaminated water infiltrating in as a vacuum is drawn by water moving from high pipes to lower areas;
- Lack of fire protection: The hydrants in Meadow Brook and the Rae Subdivision indicate some fire protection is obviously planned to be supplied by the water system, but none is available. According to the Montana Department of Environmental Quality (DEQ), since there is intent to provide fire protection, the district is obligated to provide fire protection for the whole district;
- Pipe network: Major improvements are needed within the trailer court to deliver fire flow regardless of the storage quantity provided (do not meet the minimum of six inches for a hydrant connection) and to reduce leakage; and
- Lack of supply: Current supply is insufficient to meet peak hour demand when the largest well is out of service.

The proposed improvements, as recommended in the PER and as indicated by the district, consist of constructing a new 380,000-gallon water storage tank, upgrading the existing Supervisory Control and Data Acquisition (SCADA) system to include the water system, installing a new eight-inch water main through the trailer court, and installing a new six-inch "raw" water line from the two main wells to the tank. The new SCADA system will allow the district to actually save on operation and maintenance costs. The new water main will reduce the considerable amount of leakage and will allow fire protection for the trailer court. The water storage tank will provide the water capacity needed for fire protection as well as provide an adequate supply of water to meet peak hour demands.

Applicant Name Ravalli County
Project Name Improved Resource Protection, Floodplain Hazard Mapping, and Land-Use Planning for Ravalli County

Project Abstract

Ravalli County is one of the fastest growing areas in Montana. In order to identify and protect sensitive resources, update and expand flood hazard mapping, and implement sections of the Growth Policy, the county needs more accurate elevation data in digital format. The county currently has 20 to 40 foot elevation contour intervals available only on paper. As a result, an unavoidable margin of error is introduced and significant additional staff time and project costs are generated.

Phase 1 obtains one-foot elevation contour intervals using Light Detection and Ranging (LIDAR) technology for approximately 228 square miles in the fastest growing northern portion of Ravalli County. Phase 2 provides the same information. By providing this critical data, this project will help Ravalli County conserve, manage, and preserve important land, water, and wildlife resources.

The data would assist in the following areas:

- Location and maintenance of irrigation ditches;
- Groundwater monitoring (wastewater permits);
- Subdivision review – impacts to agriculture, irrigation systems, wildlife and habitat, surface/groundwater quality and quantity, surface water features (streams, rivers, and riparian areas), wetlands;
- Sensitive areas – agricultural lands, groundwater recharge areas, wetlands, riparian areas, wildlife habitat/corridors (including elk winter range);
- Accurate determination of riparian setback/buffer distances;
- Floodplain boundary delineations and violation determinations; and
- Road maintenance and drainage plans.

Beneficiaries would include:

- Landowners, residents;
- Local businesses – realtors/brokers, developers, surveyors, engineers, architects, builders, landscape designers, well drillers, hydrologists;
- Irrigation districts, surface water right holders;
- Visitors, recreationists, outfitters (hunting, fishing);
- Ravalli County boards – Commissioner, Planning, Health, Right to Farm and Ranch, Weed, Park;
- Ravalli County departments – Planning, Environmental Health, Floodplain, Roads and Bridges, Geographic Information System (GIS), Disaster and Emergency Services;
- Communities – Florence, Stevensville, Victor, Corvallis, Pinesdale, Hamilton, Darby, Conner, Sula; and
- Ravalli County Fish/Wildlife Association, Bitter Root Water Forum, Bitter Root Land Trust, Bitterroot Trout Unlimited, Montana Audubon, Montana Wetlands Legacy, Bitterrot Conservation District, Extension Services, Natural Resources Conservation Service (NRCS), Farm Service Agency (FSA).

Applicant Name Red Lodge, City of
Project Name Red Lodge Water System Improvements

Project Abstract

The City of Red Lodge was founded in the mid-1880s and has had a municipal water system for almost 100 years. Although the city has continually improved the water system since the 1970s, some elements are nearly as old as the system itself.

The city's water distribution system has the following deficiencies:

- Undersized distribution lines;
- Insufficient storage;
- Insufficient number of hydrants; and
- Transmission lines at the end of their service life.

The water distribution system suffers from several serious deficiencies including:

- Lack of adequate fire flows;
- Loss of about half (48% to 54%) of its treated water to leakage, a significant waste of resources and is a limiting factor in Red Lodge's economic growth; and
- Potential contamination of its drinking water supply due to negative pressure in leaking transmission lines.

The following water distribution system improvements are recommended to solve these deficiencies:

- Replace all existing two-inch mains within city boundaries;
- Replace all four-inch mains west of Word Avenue;
- Install a concrete storage tank at the water treatment plant to ensure adequate water at peak- and fire-flow conditions;
- Install new fire hydrants; and
- Replace transmission lines from the treatment plant to the city.

Benefits to natural resources as a result of this project include conservation of millions of gallons of treated water that would otherwise be lost to leakage, expansion of system capacity to allow for future growth, development of water storage, preservation of system water quality, and improvement of infrastructure to allow for future economic development and population growth.

The total cost of the above improvements is estimated to be approximately $3,770,000. The proposed repairs will correct existing deficiencies.

Applicant Name Ronan, City of
Project Name Ronan Wastewater System Improvements

Project Abstract

The City of Ronan's wastewater treatment system is comprised of gravity mains, force mains, four lift stations, aerated lagoons, and wetlands tertiary treatment. The wetlands discharge to surface water.

In July of 2004, the City of Ronan was issued an Administrative Order from the Environmental Protection Agency (EPA) to install a disinfection system at the outfall of their wastewater wetlands cell before discharge to Crow Creek. Fecal coliform levels frequently exceed the system's National Pollutant Discharge Elimination System (NPDES) permit levels. To comply with the order, the disinfection system must be operational by July 21, 2007.

The preferred alternative identified by the Preliminary Engineering Report (PER) is to install an ultraviolet disinfection system for the wetlands discharge and to provide auxiliary power to the four lift stations in the collection system.

Disinfection of the wetlands effluent is essential to preserve groundwater and surface water resources. Fecal coliform levels in the effluent from the wetlands range from 1 to over 100,000 organisms/100ml and frequently exceed the NPDES permitted level of 200 org/100ml. Crow Creek is classified by Tribal Water Quality Standards as a B-1 water body (suitable for bathing, culinary activities, and drinking water with conventional treatment). Ultraviolet radiation disinfection will control the fecal coliform levels in the effluent.

This project will purchase and install auxiliary power to the lift stations. Currently, no alternative power source is available for emergency power outages. Without an auxiliary power source, sewage can back up and overflow low-lying manholes. Auxiliary power is essential to preservation of groundwater and surface water resources. If the lift stations or manholes were to overflow, sewage could enter Spring Creek and the shallow groundwater.

Applicant Name Sanders County
Project Name Eliminating Failed and Obsolete Septic Systems in Sanders County

Project Abstract

The project would establish a Revolving Loan Fund (RLF) with the $100,000 Renewable Resource Grant. This fund would be accessible to eligible citizens in the county, to assist them with the cost of replacing their failed or obsolete system, or hooking into a municipal system if one is in close proximity. The loans would remove a significant barrier people face in bringing systems into compliance. The RLF would be administered by the Sanders County Community Development Corporation. The RLF is part of an emergency measure to correct immediate and serious threats to water quality, aesthetics, and the environment, as well as human health and safety. The next phase of the program would seek long-range solutions for proper sewage disposal for each community and homeowner in the county.

Sanders County did not permit septic systems until 1995. Over 80% of the homes were built before septic permits, resulting in many inadequate, obsolete, illegal, and non-functioning septic systems. Communities with a high density of older septic systems include: Thompson Falls, Noxon, Trout Creek, Heron, Paradise, and Camas. The County's Sanitarian office has dealt with over 40 failed septic systems since May 2005. Failures have included collapsed metal tanks, surfacing effluent, pipes discharging sewage directly into "air vents," and other illegal systems. Collapsing metal tanks present an additional safety concern, especially in residential areas.

Repairing these obsolete systems would "enhance the common well-being" of the citizens of and visitors to Sanders County by preserving and conserving water quality, a precious renewable resource.

Applicant Name Seeley Lake – Missoula County Water District
Project Name Seeley Lake Water System Improvements

Project Abstract

The Seeley Lake Water District water system is currently grossly inadequate to either provide for an acceptable level of fire protection to the community or maintain adequate pressures during high water demands. The inability to suppress a fire poses a substantial risk of loss, not only to physical structures within the community but also to the national forest resources surrounding and identifying this resort community. Estimated available fire flows to the community are as low as 200 gallons per minute (gpm) in many areas of the system with both commercial structures and schools, where the available fire flows should be in excess of 1,500 gpm. A major fire event resulting from the inability to suppress even a minor structure fire would prove catastrophic to the community both environmentally and economically, as this community relies on the natural forest and water resources for its commercial and recreational livelihood.

The proposed project will include a new 500,000-gallon water storage tank, a new high service pump station, replacement of approximately 12,000 feet of small diameter transmission main, approximately 3,000 feet of new distribution system mains, and modifications to the disinfection process to facilitate compliance with the Disinfectants/Disinfection By-Product Rule.

System improvements will provide for adequate system pressures and fire flows for existing customers, provide for expansion of the customer base, and allow more efficient and maximum use of available surface water. The project will provide both an expanded benefit and also enhance the existing benefit through development of the infrastructure necessary to effectively manage and deliver the district's water resources. The project will further improve management of the district's water resources through new telemetry and automation equipment and additional water metering equipment to accurately account for the treated water production rates.

Applicant Name Shelby, City of
Project Name Shelby Water System Improvements

Project Abstract

The City of Shelby has been very fortunate in the insight and forethought of community leaders to address water-related issues efficiently and in a timely manner before dire problems threatened the water system. Several projects are top priority for the water system at this time. The city water system was established over 65 years ago, with original wells drilled in the 1940s. The well field is seven miles south of Shelby on the Marias River. Twelve wells produce water for the City of Shelby. Recently, well number four was found by the Montana Department of Environmental Quality (DEQ) to be susceptible to groundwater contamination. A new well was completed in 2005 and a new well house will be completed this spring. A new disinfection facility was also completed last fall to address pressing water issues. Completion of this water source project will include protection of the wells from flood waters, especially in the areas immediately adjacent to the well heads. An impervious seal 100 feet in diameter will be completed to prevent flood waters from percolating along the casings and directly into the well influence area.

Within the City of Shelby many of the original water lines are still in operation, but quickly deteriorating. The city has spent considerable time and expense in repairing the aging asbestos cement piping. In just the last two years, the city has incurred over $20,000 in road repair costs and an additional $20,000 in overtime wages to city employees working on the leaks and major breaks associated with these older lines. Not only is the city concerned with the health and safety risks of these old service lines and the tremendous expense they are creating for the community, but also the inadequacy in size of lines to meet essential fire flow and service needs. These projects are of immediate concern in regard to potential impact of contamination, inadequate fire flows and service needs, high maintenance requirements, and water loss.

Applicant Name Sheridan County
Project Name Raymond Dam Rehabilitation Project

Project Abstract

Raymond Dam is a 16-acre public recreational reservoir constructed by the Work Projects Administration (WPA) in 1936. Over the years, gradual siltation and a 1993 flash flood have reduced the reservoir's storage capacity and deteriorated its recreational value for fishing, swimming, and boating. Sheridan County is requesting $100,000 in Renewable Resources Grant and Loan (RRGL) funding to prepare an engineering assessment and dredge the sediment build-up from the reservoir to preserve recreational and other public benefits provided by Raymond Dam. Sheridan County will provide $37,030 in matching funds, for a total project budget of $137,030.

Applicant Name Sheridan, Town of
Project Name Sheridan Wastewater System Improvements

Project Abstract

In June 2004, the Montana Department of Environmental Quality (DEQ) notified the Town of Sheridan that the community's wastewater treatment lagoon was seriously out of compliance with Sheridan's Montana General Discharge Permit (MPDES) discharge permit requirements. DEQ is requiring Sheridan to address all system deficiencies within a set time. Violations include overloading the lagoon, resulting in discharge of poorly treated wastewater to the Indian Creek drainage. In addition, the violation notice addressed embankment leakage.

Inadequate treatment and pond leakage is polluting the Indian Creek drainage with inadequately treated wastewater. Excessive groundwater infiltration into the collection system during the summer aggravates the treatment overloading problem by increasing the amount of water flowing into the lagoon. The current treatment facility poses a serious threat to public health and safety in addition to environmental pollution to several waterways. Nearby drinking water wells and downstream surface water supplies used for drinking water are the most threatened public services.

The proposed wastewater system improvement project will improve wastewater treatment, reduce the pollutant load to the receiving waters, and reduce infiltration of poorly treated wastewater to the groundwater. The new lagoon will reduce pollution levels in the receiving water, maintain a beneficial reuse of the stabilized wastewater for irrigation, and meet all water quality standards in the irrigation ditch system as well as in Indian Creek.

Land will be purchased for construction of a new mechanically aerated treatment lagoon. The landowner of the proposed lagoon site owns both wheel lines and center pivot spray irrigation systems. The owner intends to supplement the existing irrigation water supply with treated effluent from the lagoon with no impact to the lagoon operation.

The new treatment facility will greatly improve air and water quality by correcting the wastewater treatment deficiencies. Collection system improvements will reduce the amount of wastewater entering the lagoons and reduce groundwater pollution caused by exfiltration of sewage from the collection system during periods of low groundwater. Reducing groundwater infiltration and the amount of wastewater being treated will conserve energy by reducing demand on the aeration system blowers. The use of treated wastewater for irrigation maintains the current beneficial reuse of water.

Applicant Name Sidney Water Users Irrigation District (SWUID)
Project Name Sidney Water Users Increasing Irrigation Efficiency Phase 2

Project Abstract

The proposal area covers 5,074 acres of irrigated land south of Sidney in Richland County. The SWUID diverts its irrigation water through three river pumping plants.

The SWUID has three primary concerns: water quantity, erosion and sedimentation, and reduction of noxious weeds. Current conditions on the project are 22.5% overall irrigation water-use efficiency, an estimated 10 tons of soil loss per acre from furrow erosion, and 300 acres of noxious weed infestation.

The goals of this project are to: increase overall system efficiency by 30% over a six-year period; reduce soil erosion to sustainable levels; and reduce noxious weed infestations by 75%. This specific project will increase the efficiency of the existing laterals from 22.5% to 73.5%.

Two additional socioeconomic goals are to improve the economic viability of the agriculture sector within SWUID and to either reduce power consumption by 18% or add acres irrigated within the district. Either, or a combination of the two, will result in the district becoming more productive and profitable.

The means to achieve the goals and objectives will be the most efficient and cost-effective method of addressing the problem developed through Natural Resources Conservation Service (NRCS) Resource Management System (RMS) planning for groups involved with laterals and on-farm planning. The district will do the construction to the extent possible.

A Renewable Resources grant is requested in the amount of $100,000 to replace an existing open canal system to Relift 1-2 with pipe off the No. 1 pumping plant. Flood irrigation on farms will be replaced with gated pipe and sprinklers through NRCS Environmental Quality Incentive Program (EQIP). In-kind contribution by the district will be $16,567 of the total cost of $237,167.

Applicant Name Stillwater Conservation District
Project Name Stillwater-Rosebud Watershed, Surface Water/Groundwater Interactions

Project Abstract

The Stillwater River and Rosebud Creek watershed has experienced tremendous population growth (over 28% between 1990 and 2000). People are drawn to the region by the scenic views and the numerous high-quality streams and fisheries, so they have a desire to maintain and protect these water resources into the future. However, the increasing population also poses a risk to these streams. Groundwater pumping may intercept baseflow to streams, or it may even intercept streamflows directly. The relationships between groundwater and surface water have not been defined in the watershed. It is also not known how much development the area aquifers can support.

This project will collect integrated groundwater and surface water data necessary to better manage and plan the development occurring in the watershed. Data from the project will be used to evaluate aquifer potential, assess recharge sources and rates, and evaluate the interactions between groundwater and the streams. The project will build upon previous well inventories to create a detailed groundwater monitoring network to evaluate seasonal level fluctuations. At selected locations, paired wells will be installed and tested to define aquifer characteristics. In addition, an extensive network of stream gauging sites will be established to assess groundwater discharge to streams and ditches and/or groundwater recharge from streams and ditches. This information will enable resource managers and area residents to make more informed decisions to manage development to protect the area streams. Public meetings will be conducted throughout the project to obtain public input and to present preliminary findings. Project information will be available free from the Internet and will include a report and maps depicting aquifer distribution, probable drilling depths, and groundwater flow patterns. The final report will describe how the data were collected and describe what the information means.

Applicant Name Sunburst, Town of
Project Name Sunburst Back-up Water Supply Wells

Project Abstract

The Town of Sunburst was given several water wells formerly used by an oil company to supply a refinery at Sunburst. Two wells, one hard water and one soft water, have been used to supply water to the town. Corrosive, high-sulfur water ate through the casing in the soft water well in 2001 resulting in growth of sulfur-reducing and iron-related bacteria. This corrosion disrupted the water supply of the town until the well could be replaced. To avoid future disruptions, Sunburst recently renovated two wells for use as a backup supply, and plugged and abandoned unused wells that posed a possible contamination threat to the Virgelle Aquifer supplying the wells. Because one of the wells could not be renovated and had to be re-drilled, funds were not available to connect the wells to the existing supply. This proposal is for funding to connect the rehabilitated wells to the system and confirm the source of the contamination (dryland salinity is suspected). A civil engineer with experience in municipal water supply will design and supervise the connection. All work will be performed by qualified, bonded contractors. Up-gradient shallow wells will be evaluated to determine the source of the high sulfur content and bacteria which have been found in past samples from some Sunburst wells; steps to prevent future contamination will be recommended.

Applicant Name Sunny Meadows Missoula County Water and Sewer District
Project Name Sunny Meadows Water System Improvements

Project Abstract

The Sunny Meadows Missoula County Water and Sewer District was formed in 2006 and operates a community water supply system. The district's usable water storage capacity of 23,000 gallons is grossly inadequate to meet the community's needs and results in the district running out of water on a regular basis during the summer. The district's booster station is severely substandard and homes served by the booster station report running out of water on a daily basis during high usage periods. Residents have reported hearing air sucking into home water fixtures when opened and hearing water backflowing through the booster pump and into the water storage tank which supplies water to the remainder of the district. Contamination of the drinking water due to backflow is a severe threat to public health and safety and is recognized by the Environmental Protection Agency (EPA) to be one of the most significant threats to public water supplies in the United States. The original residential water meters within the district are old, inaccurate, and have problems with leakage.

A new 125,000-gallon steel water storage tank will be constructed. This construction will increase the utilization of water by supplying all system water demands, including fire protection. Existing antiquated meters will be replaced, resulting in a contribution to water conservation. A telemetry system, allowing remote operation of the water system, will be installed. Remote operation will maximize pumping and power efficiency and decrease operation costs for the district. The project will also replace existing well pumps and install new valve house piping, including water meter, pump control valve, sampling taps, and required piping and valves to reduce hydraulic restrictions. The project will solve all serious health and safety problems and enhance the common well-being of Montanans through the conservation, management, development, and preservation of the district's public water system.

Applicant Name Sunset Irrigation District
Project Name Gravity Flow Group Irrigation Pipelines

Project Abstract

The purpose of the Renewable Resources Grant and Loan Program (RRGL) is to enhance Montana's renewable resources. Water is a vital renewable resource for all of Montana, and the aim of this project is to modernize an existing flood irrigation system on Sunset Bench near Stevensville to a water and energy-efficient gravity flow sprinkler system. Currently, the water distribution system is a flood irrigation system with flows diverted from Burnt Fork Creek onto Sunset Bench near Stevensville. In addition, Sunset Irrigation District owns Burnt Fork Reservoir and releases additional water for irrigation late in the summer. About 40% of the lands irrigated have converted to sprinkler systems and are using electricity to pump water for the sprinklers out of the two main ditches (Highline and Baker Ditches, which are about 15 miles long). The water delivery system will be modernized by changing to a gravity flow sprinkler system on the lands served in the Sunset Irrigation District boundaries. This change will have many incidental enhancements to many other important renewable resources.

The primary project goal is to eliminate dependence on electricity to pump water to existing sprinklers and to allow the remaining lands in the district to convert to sprinklers without depending on electricity to pump water. This conversion will increase irrigation efficiency and agricultural crop production and profits; it will also eliminate energy costs which are expected to rise dramatically when current electric rate contracts expire with the Ravalli County Electric Cooperative, Inc., in 2011. Less natural flow water will need to be diverted from Burnt Fork Creek to irrigate, and storage water from Burnt Fork Reservoir will be released in different amounts and at different or additional times than currently.

This design and construction project proposes to:

- Place Highline Ditch, currently an open ditch, in a pipe to increase the pressure of the water diverted from the headgate on Burnt Fork Creek;
- Eliminate Baker Diversion and replace the existing 36-inch steel pipeline with a 36-inch polyvinyl chloride (PVC) pipeline that can convey all the flow required by both ditch sytems;
- At the outlet of the 36-inch PVC pipeline, 3,200 feet of PVC pipe will drop down to Baker Ditch in the east one-half of Section 10 and continue to utilize Baker Ditch as an open ditch; and
- Place a 30-inch PVC pipe continuing west for 1.8 miles to convey irrigation water for Highline Ditch system acres.

Additional benefits that improvements to the water distribution system on the Sunset Irrigation District lands will have on other renewable resources include:

- Stabilize streamflows in Burnt Fork Creek, protecting water quality, controlling streambank erosion, and improving riparian areas for wildlife and forage;
- Enhance sustainable fisheries in Burnt Fork Creek;
- Hydrologically reconnect portions of Burnt Fork Creek;
- Maintain a productive agricultural base of irrigated pasture and hay land;
- Preserve open space and green areas in the Bitterroot Valley represented by productive grazing lands and hay fields; and
- Create a water source available for the future needs of the Stevensville area and/or Burnt Fork watershed.

Applicant Name Superior, Town of
Project Name Superior Water System Improvements

Project Abstract

The water system that serves Superior residents was privately owned by the Mountain Water Company in Missoula, but was recently purchased by the town and is now operated as a government-owned utility. The water supply is derived from three wells located in the community which provide adequate and good quality water. Storage is provided with a 400,000-gallon steel storage tank, generally adequate for domestic use but limited in volume for fire protection. The distribution system is made up of about 55,500 lineal feet of a variety of types of water mains ranging in size from one inch to 12 inches in diameter. More than 45% of the entire distribution system is undersized and is constructed of steel or cast iron pipe four inches and less in diameter. Many of these smaller diameter lines are estimated to be 50 to 70 years old. In addition, about 26% of the "water mains" in the system are one or two inches in diameter. Unaccounted for water losses total about 27% in the system; much of the leakage originates from the old mains and services. Water modeling indicates that much of the distribution system cannot provide adequate fire protection for larger business and institutional structures located throughout the community. The proposed project will replace or upgrade almost 10% of the total lineal footage of the water system. The project will conserve water resources through reduction in leakage and reduce energy utilized to pump water through small-diameter and corroded water lines. A large percentage of the new mains are in business areas constrained by lack of adequate water. New business growth can be anticipated with additional water resources. The improvements will significantly enhance the ability of the town to provide adequate supplies of water.

Applicant Name Sweet Grass County Conservation District (SGCD)
Project Name West Boulder Point of Diversion Rehabilitation Project

Project Abstract

The SGCD, on behalf of the Boulder River Watershed Association (BRWA) requests $40,455 in funding for rehabilitation of a diversion structure on the West Boulder River south of Big Timber. Like most diversion structures in the district, this structure is relatively small and shared by multiple users. The structure supplies a canal five miles long that irrigates 110 acres of cropland and 50 acres of pastureland. Crops are small grains rotated in every five to eight years, with alfalfa being the permanent cover crop. The pastureland is grazed by cow-calf pairs. For six months the diversion also provides livestock water to approximately 50 cow-calf pairs grazing native rangeland.

Due primarily to design deficiencies, the structure requires extensive maintenance that negatively impacts the integrity of the West Boulder River. Heavy equipment is frequently used in the channel to remove woody debris and accumulated sediment. These problems are the result of poor orientation of the structure to the main flow and deteriorated sediment transport capacities in the channel. Short-term repairs that have been performed to maintain grade at the structure exacerbate sedimentation problems and are at risk of failure.

SGCD proposes to obtain a grant to improve the infrastructure on the site that will provide long-term functionality with greatly reduced minimal maintenance. It is important to note that the West Boulder River watershed has an extensive system of such small structures, many of which have similar maintenance problems.

This project warrants funding because:

- Its visibility and representation of problems in the district make it an excellent local demonstration project for renewable resource management;
- The project will benefit Montana citizens by greatly reducing in-channel disturbance to valuable fish habitat; and
- It will result in a total savings in maintenance costs of approximately $3,575/year or $71,500 over 20 years.

Applicant Name Thompson Falls, City of
Project Name Thompson Falls Water System Improvements

Project Abstract

The city proposes to replace leaky, undersized water mains in two residential areas of Thompson Falls. Existing 1.50 to four-inch steel mains will be replaced with six-inch polyvinyl chloride (PVC) mains.

The project includes:

- Installation of new service lines to the property line and installation of water meter pits for 35 users in the area of the improvements;
- Reconfiguring system pressure zoning to switch a residential area to the upper pressure zone to eliminate low pressure problems; and
- Liquid chlorine storage improvements to comply with the Montana Department of Environmental Quality (DEQ) operation and maintenance (O&M) inspection recommendations.

The improvements will reduce water losses, eliminate low pressure problems, improve system looping to significantly increase fire protection, and provide fire protection to unprotected areas.

The proposed project results in resource conservation, resource management, and citizen benefits:

- Resource conservation benefits through improved efficiency and utilization practices by replacing leaky water mains and installing water meter pits at the property line;
- Resource management benefits through updated metering; and
- Citizens benefits through eliminating low pressure problems (which eliminates backflow/water system contamination potential), by providing fire protection capabilities where fire protection does not exist, and by providing significant improvement in fire protection in residential areas.

The city has made a concerted effort to update service lines and meters. When water main improvements are completed, service lines are replaced from the water main to the property line, at which point meter pits are installed. These improvements assure the water distribution and service lines are water tight to the point of metering. This policy was adopted to assure that water that may be lost in private service lines is metered before loss and to provide incentive to users to repair leaking service lines.

Applicant Name Three Forks, City of
Project Name Three Forks Wastewater System Improvements

Project Abstract

Three Forks is served by a central collection and treatment system. The treatment facility consists of two facultative lagoons, a storage lagoon, and two infiltration/percolation cells. Discharge is to groundwater and the Madison River.

The storage lagoon leaks excessively and the facility is undersized for existing flows, resulting in inadequate treatment. These conditions result in marginally treated wastewater reaching groundwater. Over time, nutrients and bacteria discharged to groundwater will lead to degradation/contamination of the nearby recreational ponds, resulting in a public health hazard. The configuration of the lagoon discharge outfall results in non-disinfected wastewater flowing down the bank of the river. The Montana Department of Environmental Quality (DEQ) and Montana Department of Fish, Wildlife & Parks (DFWP) have received several complaints due to odor, effluent color, and algae growth associated with the exposed discharge. Due to the potential for contact with the discharge, DEQ has indicated that the city's next discharge permit will have a fecal coliform limit.

Proposed improvements include construction of a three-cell aerated lagoon and a two-cell (14-acre) constructed wetlands treatment system. The beneficial reuse of domestic wastewater for constructed wetlands represents the development of a natural resource. The wetlands will provide additional treatment and nutrient removal and will provide habitat for wildlife and waterfowl. The treatment ponds and wetlands will have a synthetic liner to prevent leakage. The point of discharge for the outfall line at the river will be reconfigured and the pipe submerged. The lagoons and wetlands will improve effluent quality, resulting in improved in-stream water quality. The discharge will be disinfected and treatment efficiency will improve so that public and environmental health hazards are significantly reduced and a renewable resource is protected and preserved.

The project will solve serious health and safety problems and enhance the common well-being of Montanans through the conservation, management, development, and preservation of the city's wastewater system.

Applicant Name Tri County Water and Sewer District
Project Name Tri County Water System Improvements

Project Abstract

The Tri County Water and Sewer District is located in portions of Teton, Cascade, and Chouteau counties. The district is a rural service area of approximately 95,000 acres and serves approximately 450 people. The district's water system was constructed in 1982 and consists of 218 miles of water mains, a single supply source, and a storage tank.

A second water supply is needed to provide redundancy. Redundancy will provide protection against contamination of the only source and also meet system demands should one source be out of service. An improved source is also needed to ensure the district is not left without water during droughts.

The existing distribution system is undersized for peak demands and operating pressures do not meet minimum required pressures for all portions of the distribution system. As a result, portions of the system run out of water completely during peak demand periods.

The proposed project will construct an additional infiltration gallery, wet well, and pump house to provide the district with additional supply capacity and also provide a redundant water supply. In addition, approximately 20,000 lineal feet of undersized distribution system piping will be replaced and a new booster pump station added.

Replacement of a portion of the distribution system will allow the system to operate more efficiently, resulting in energy conservation. The piping improvements will also allow the district to provide water to all users during peak demand periods, which will aid in its management of the resource. These improvements will also preserve the renewable resource benefits that the water system currently provides. Construction of a new water supply will develop and expand the utilization of a natural resource.

The project will solve serious health and safety problems and enhance the common well-being of Montanans through the conservation, management, development, and preservation of water, a renewable resource.

Applicant Name Twin Bridges, Town of
Project Name Twin Bridges Wastewater System Improvements

Project Abstract

The Town of Twin Bridges is currently served by a central wastewater collection and treatment system originally constructed in 1963. The existing wastewater treatment facility was upgraded in 1991 by lining the two facultative lagoons, modifying piping, and installing a multi-level weir at the discharge to Bayers Ditch.

The existing treatment facility consists of two cells and has a detention time of about 129 days, neither meeting the Montana Department of Environmental Quality (DEQ) requirements. With the shortened detention times, marginally treated wastewater is discharged in Bayers Ditch, which meanders through agricultural land north of town. The existing discharge does not meet water quality standards for ammonia, resulting in ammonia toxicity in the receiving waters, which is harmful to fish, amphibians, and other aquatic life. The town has reached the 1993 non-degradation population and will exceed non-degradation limits with any additional growth.

The proposed solution is to upgrade the existing discharging facultative lagoon system by adding a storage lagoon and spray irrigation system. The existing two-cell facultative treatment lagoons will continue to provide primary treatment. A storage cell with a synthetic liner will be constructed on property immediately south of the existing facultative treatment lagoons. Effluent will be applied to the agricultural land at agronomic rates from April through October. When required in the future, sludge will be removed and land-applied at a suitable site. The proposed system will eliminate the discharge to Bayers Ditch and the need for a Montana Pollutant Discharge Elimination System (MPDES) permit. The proposed project will allow for beneficial reuse of nutrient-rich effluent and will remedy the most significant public health and safety problems relating to wastewater treatment and disposal in Twin Bridges. The project will allow the town to better manage an existing natural resource and will result in adequate system capacity to serve the town through the planning period, with consideration for expected community growth.

Applicant Name Whitefish, City of
Project Name Whitefish Wastewater System Improvements

Project Abstract

The Whitefish Wastewater Treatment Facility was modified from "Phase Isolation" treatment to an aerated lagoon facility in 1978. In 1986, improvements were made to the Main Lift Station and a phosphorous-removal process was added downstream from the facility's aerated lagoons. In 1995, the city received an Administrative Compliance Order (ACO) from the Montana Department of Environmental Quality (DEQ) in response to unpermitted overflows and bypasses during high flow events. Since that ACO, the city has implemented numerous projects to rectify problems with the wastewater infrastructure, including inflow mitigation, long-term solids handling, upgrading the aeration system, influent structure, Main Lift Station pump capacity, and control improvements. In 2005, the city initiated the process of updating its overall Utility Master Plan and identified a number of remaining needs throughout the wastewater system. In 2006, the city completed a Wastewater System Preliminary Engineering Report (PER) that further assesses the remaining needs, evaluates feasible alternatives, and recommends capital improvements to address those needs. The remaining wastewater infrastructure needs include Main Lift Station capacity enhancements, new pretreatment process, Main Lift Station wetwell maintenance, phosphorous-removal process redundancy, rehabilitation of the existing flocculating clarifier, evaluation of the effluent diffuser, bio-solids disposal permitting, and repair of eroded dikes in the aerated lagoons. The city anticipates funding through the Treasure State Endowment Program (TSEP) and the Renewable Resources Grant and Loan Program (RRGL) to implement specific recommendations from the 2006 Wastewater PER. These include pretreatment, Main Lift Station bypass capability, and phosphorous-removal redundancy.

The remaining problems at the Whitefish treatment facility are an inefficient and dangerous pretreatment process (manually cleaned bar screen in a confined space), the inability to bypass the Main Lift Station for necessary wetwell cleaning and maintenance, and lack of redundancy in the phosphorous-removal process. Several other needs were identified in the 2006 wastewater PER as explained above, but the city has committed to implementing those capital improvements with its own resources due to time constraints.

The proposed project involves constructing a new building adjacent to the Main Lift Station that will house an automated rotary screen pretreatment process. The new equipment will remove solids and stringy materials from raw wastewater more efficiently and will de-water and containerize the materials for disposal. The new building will also include a "bypass basin" that will be plumbed for use in bypassing the Main Lift Station. When influent flows are diverted to the bypass basin, a trailer-mounted, high-volume, suction-lift pump would convey the wastewater directly to the forcemain downstream of the Main Lift Station and on to the wastewater plant for treatment. This will allow temporary bypassing of the Main Lift Station for needed inspection, cleaning, and maintenance of the wetwell. Finally, the project will include construction of another flocculating clarifier, similar to the existing clarifier. A second clarifier will provide redundancy in the phosphorous-removal process and allow the city to ensure continued compliance with its Montana Pollutant Discharge Elimination System (MPDES) permit. Redundant clarifiers will also allow the city to perform necessary maintenance and repairs on its existing clarifier without suspending phosphorous removal. Without the new clarifier, the existing clarifier cannot be taken out of service.

Applicant Name Whitehall, Town of
Project Name Whitehall Wastewater System Improvements

Project Abstract

Whitehall is served by a central collection and treatment system. The treatment facility consists of two facultative lagoons and ultraviolet (UV) disinfection. Discharge is to Big Pipestone Creek.

The existing lagoon leaks excessively and the facility is undersized for existing flows, resulting in inadequate treatment. The discharge from the facility results in ammonia toxicity in the receiving waters. Big Pipestone Creek is impaired due to these nutrients. The lagoon discharge and leakage are impacting Big Pipestone Creek as increased algae growth has been documented below the lagoons. The Montana Department of Environmental Quality (DEQ) has indicated that since nutrients are a cause of impairment to Big Pipestone Creek, nutrient limits will likely be imposed in future permits. The existing facility will be unable to meet the anticipated in-stream target concentrations for nitrogen and phosphorous. The sewer collection system experiences some inflow and infiltration. The identified sources of these increased flows include four storm sewer inlets connected to the sewer system and old clay tile pipe sewer mains.

Proposed improvements include construction of a single 7.7-acre facultative primary treatment cell and an 11.5-acre storage cell. The lagoons will be lined with a synthetic liner to protect groundwater and nearby surface water. Wastewater will be land-applied, at agronomic rates, to crop land. The beneficial reuse of domestic wastewater for irrigation represents conservation of a natural resource. Eliminating the discharge to Big Pipestone Creek will significantly reduce public and environmental health hazards as well as improve, protect, and preserve a renewable resource. The project will rehabilitate several collection mains to eliminate infiltration and will remove four storm sewer inlets connected to the sewer system.

The project will solve all serious health and safety problems and enhance the common well-being of Montanans through the conservation, management, development, and preservation of the town's wastewater system.

Applicant Name Yellowstone Conservation District
Project Name Modeling Aquifer Responses to Urban Sprawl, West Billings Area

Project Abstract

The west Billings area in Yellowstone County has experienced tremendous growth and development. Most new homes are being built in areas beyond municipal services and these residents depend on shallow aquifers as their only source of potable water. These aquifers are primarily recharged by irrigated agricultural practices; such agricultural land is disappearing into residential developments. The loss of aquifer recharge puts future groundwater availability and quality at risk

The purpose of this project is to construct a calibrated digital groundwater model of the west Billings area in Yellowstone County. This model will provide a planning tool for managing the rapid growth and urbanization that is occurring. Alternatives such as agricultural easements, green belts, and artificial recharge could potentially offset recharge losses. However, it is not known how much recharge is required to sustain the aquifers or the locations of critical recharge areas. Also, it is not known how fast and where groundwater declines will likely occur. A digital groundwater model can be constructed with the available data to answer these unknowns.

The groundwater model will be developed using the MODFLOW program and will be calibrated to real-world-measured groundwater level and streamflow conditions. This project builds upon a wealth of hydrogeologic information obtained by previous investigations and will use these data to test various development scenarios. Information provided by this project will be critical to planners, resource managers, and area residents. Public meetings will be conducted throughout the project to disseminate information and to gain input and identify concerns. A report and the model set-up data will be publicly available from the Montana Bureau Mines and Geology (MBMG) internet webpage.